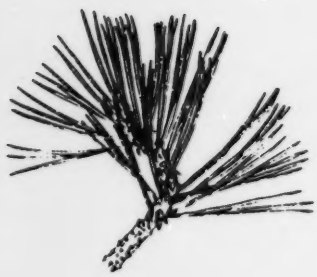
An Illustrated Key to

1 Common Grass Genera

2 Gymnosperms



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AN ILLUSTRATED KEY TO COMMON GRASS GENERA OF THE FESTUCOIDEAE (FESCUE SUBFAMILY) OF BRITISH COLUMBIA

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illustrated by G.F. Harcombe

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(Terrestrial Studies Branch)

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INTRODUCTION

This is one of a series of keys to the vascular plants of British Columbia (excluding Ferns and Fern allies). Other keys in this series are: An Illustrated Key to Gymnosperms of British Columbia, An Illustrated Key to the Monocotyledon Families of British Columbia, and An Illustrated Key to the Dicotyledon Families of British Columbia. The Grass Key is, in a way, an extension of the Monocot Key, since the latter key can be used to determine if the plant to be identified is indeed in the Poaceae (Grass Family). The grass key will enable the user to carry identification to the genus level of the more common grasses. It is hoped that this simplified key will help field workers to overcome their reluctance to identify members of the economically and environmentally important grasses. The key will serve as a practical introduction to the more complete keys of formal manuals.

The key initially points to major groups or tribes of grasses, each of which is treated separately leading to the genera. The key uses pairs of contrasting characteristics at each step. Additional characteristics are then added at the final steps to further characterize the genera. The illustrated key runs parallel to the written key. A descriptive and illustrated glossary is included for the whole key.

The fourteen terms in the written glossary were not described on the charts due to the lengthy definitions. In these cases, the more technical term was applied in order to maintain the smaller size of the charts.

The botanical names for the grass genera follow the conventions of Taylor and MacBryde (1977), and the common names follow Hubbard (1969). The name printed in italics is the botanical genus name and the name following is the authority who named the plant and provided a formal description of the genus. E.g.

Beckmannia Host

↑ ↑

genus authority

Where "(in part)" follows a family or genus name, it attempts to alert the user to the fact that only certain members of that group fall into that step of the key.

In the charts and the corresponding illustrations, circled letters serve to:

- relate the text in the chart to the appropriate drawing;
- arrive at specific groups of plants in any of the charts with the aid of the index

The selection of genera included in the key is based on the authors' field experience of frequently encountered genera. Although this key will readily permit field workers to differentiate grass genera in the field, the final identification must be verified using the formal manuals.

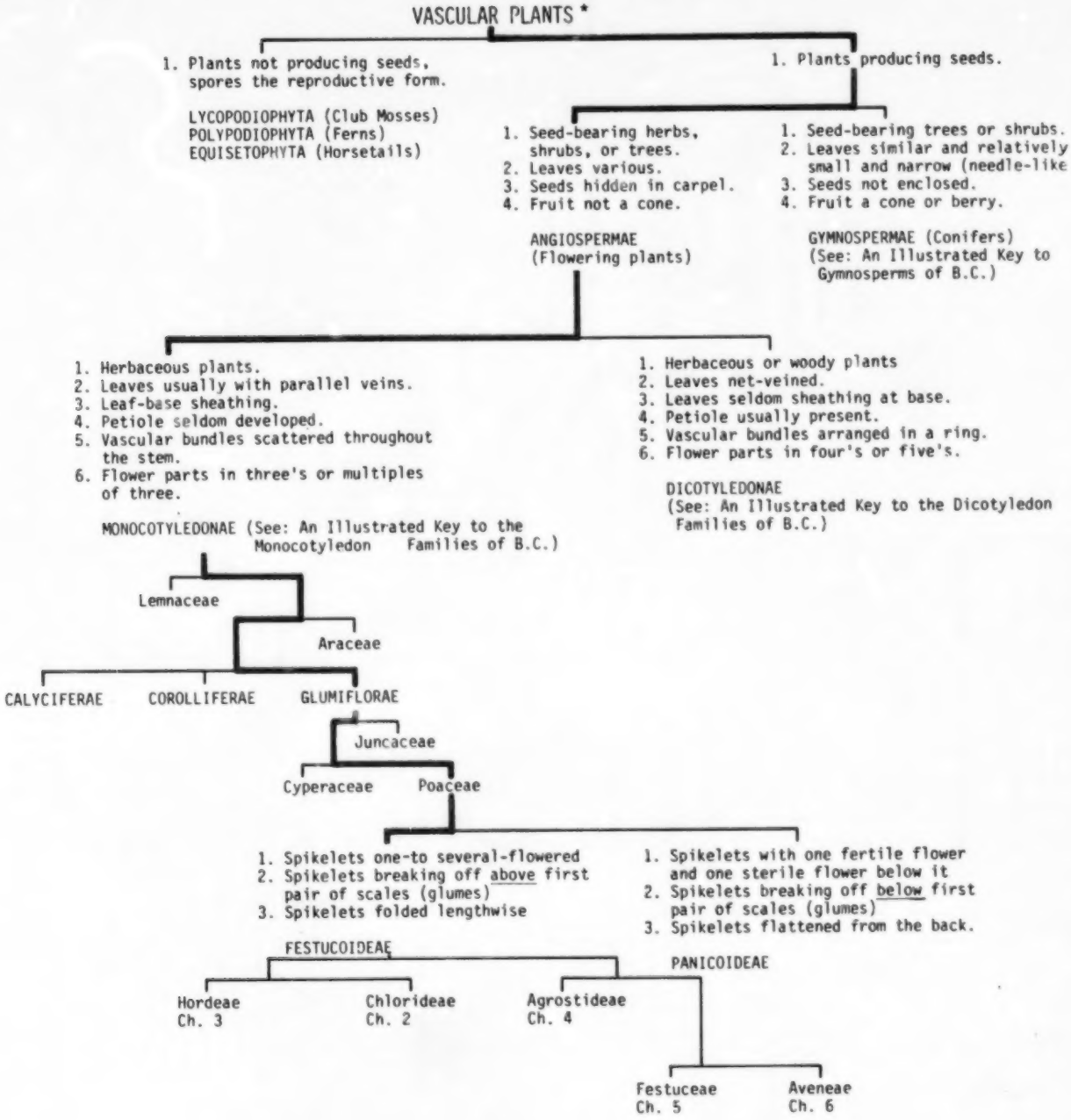
ACKNOWLEDGEMENTS

The authors are grateful to the members of the editorial committee for their constructive criticism and suggestions. The authors are also thankful to the members of the Vegetation Section of Resource Analysis Branch, Ministry of Environment, for their testing of the key and constructive criticism.

Editorial Committee:

W.A. Benson, C.M. Redmond, R.H. Reid, and the authors.

CHART 1


VASCULAR PLANTS *
1. Plants not producing seeds, spores the reproductive form.
LYCOPODIOPHYTA (Club Mosses)
POLYPODIOPHYTA (Ferns)
EQUISETOPHYTA (Horsetails)
1. Plants producing seeds.
1. Seed-bearing herbs, shrubs, or trees.
2. Leaves various.
3. Seeds hidden in carpel.
4. Fruit not a cone.
ANGIOSPERMAE (Flowering plants)
1. Seed-bearing trees or shrubs.
2. Leaves similar and relatively small and narrow (needle-like
3. Seeds not enclosed.
4. Fruit a cone or berry.
GYMNOSPERMAE (Conifers) (See: An Illustrated Key to Gymnosperms of B.C.)
1. Herbaceous plants.
2. Leaves usually with parallel veins.
3. Leaf-base sheathing.
4. Petiole seldom developed.
5. Vascular bundles scattered throughout the stem.
6. Flower parts in three's or multiples of three.
MONOCOTYLEDONAE (See: An Illustrated Key to the Monocotyledon Families of B.C.)
1. Herbaceous or woody plants
2. Leaves net-veined.
3. Leaves seldom sheathing at base.
4. Petiole usually present.
5. Vascular bundles arranged in a ring.
6. Flower parts in four's or five's.
DICOTYLEDONAE (See: An Illustrated Key to the Dicotyledon Families of B.C.)
Lemnaceae
Araceae
CALYCIFERAE
COROLLIFERAE
GLUMIFLORAE
Juncaceae
Cyperaceae
Poaceae
1. Spikelets one-to several-flowered
2. Spikelets breaking off above first pair of scales (glumes)
3. Spikelets folded lengthwise
FESTUCOIDEAE
1. Spikelets with one fertile flower and one sterile flower below it
2. Spikelets breaking off below first pair of scales (glumes)
3. Spikelets flattened from the back.
PANICOIDEAE
Hordeae Ch. 3
Chlorideae Ch. 2
Agrostideae Ch. 4
Festuceae Ch. 5
Aveneae Ch. 6

*vascular plants - a division of the plant kingdom including ferns and fern allies, and the seed bearing plants, but excluding mosses, liverworts, algae, and fungi; the term vascular refers to the system of more or less woody ducts in the higher plants used for transporting sap.

CHART 2

FESTUCOIDEAE (FESCUE SUBFAMILY)

1. Spikelets* laterally compressed (scales* usually folded lengthwise)
2. Spikelets*, when mature, usually breaking off above first pair of scales (glumes)
3. Pairs of grain-less scales (sterile florets*), if any, above the grain-bearing pairs of scales (perfect florets) at maturity.

1. Spikelets* arranged in 2 rows on fruiting stem
2. Spikelets attached directly to the main fruiting stem, without stalks

1. A single spike* at the top of each main stem.
2. Two rows of spikelets arranged on opposite sides of main fruiting stem

Ⓐ HORDEAE
(Barley Tribe)
(see Chart 3)

1. More than one spike* on each main stem.
2. Both rows of spikelets arranged on one side of main fruiting stem

Ⓑ CHLORIDEAE
(Gramma Tribe)

1. Outer pair of scales of spikelets (glumes) unequal in length and narrow
2. Plant with underground runners (rhizomes)
3. Spikelets 6-8 mm long
4. Spikelet-bearing portion of the main stem 2-4 cm long
5. Growing in alkaline meadows and plains

Ⓓ *Spartina* Schreber
(alkali cord grass)

1. Outer pair of scales of spikelets (glumes) equal in length and broad
2. Plant without underground runners (rhizomes)
3. Spikelets 3 mm long
4. Spikelet-bearing portion of the main stem 10-25 cm long
5. Growing in wet meadows and ditches

Ⓔ *Beckmannia* Host
(slough grass)

1. Spikelets* arranged more or less all around the fruiting stem
2. Spikelets attached to the main fruiting stem by side branches (sometimes side branches short and not easily recognized)

1. Spikelets 1-flowered

Ⓒ AGROSTIDEAE
(Timothy Tribe)
(see Chart 4)

1. Spikelets 2- to many-flowered

1. Outer pair of scales of spikelets (glumes) shorter than third scale (which belongs to first floret = 1st lemma)
2. Inner scales of spikelets (lemmas) usually without a slender stiff bristle (awn), if awned then from near the tip

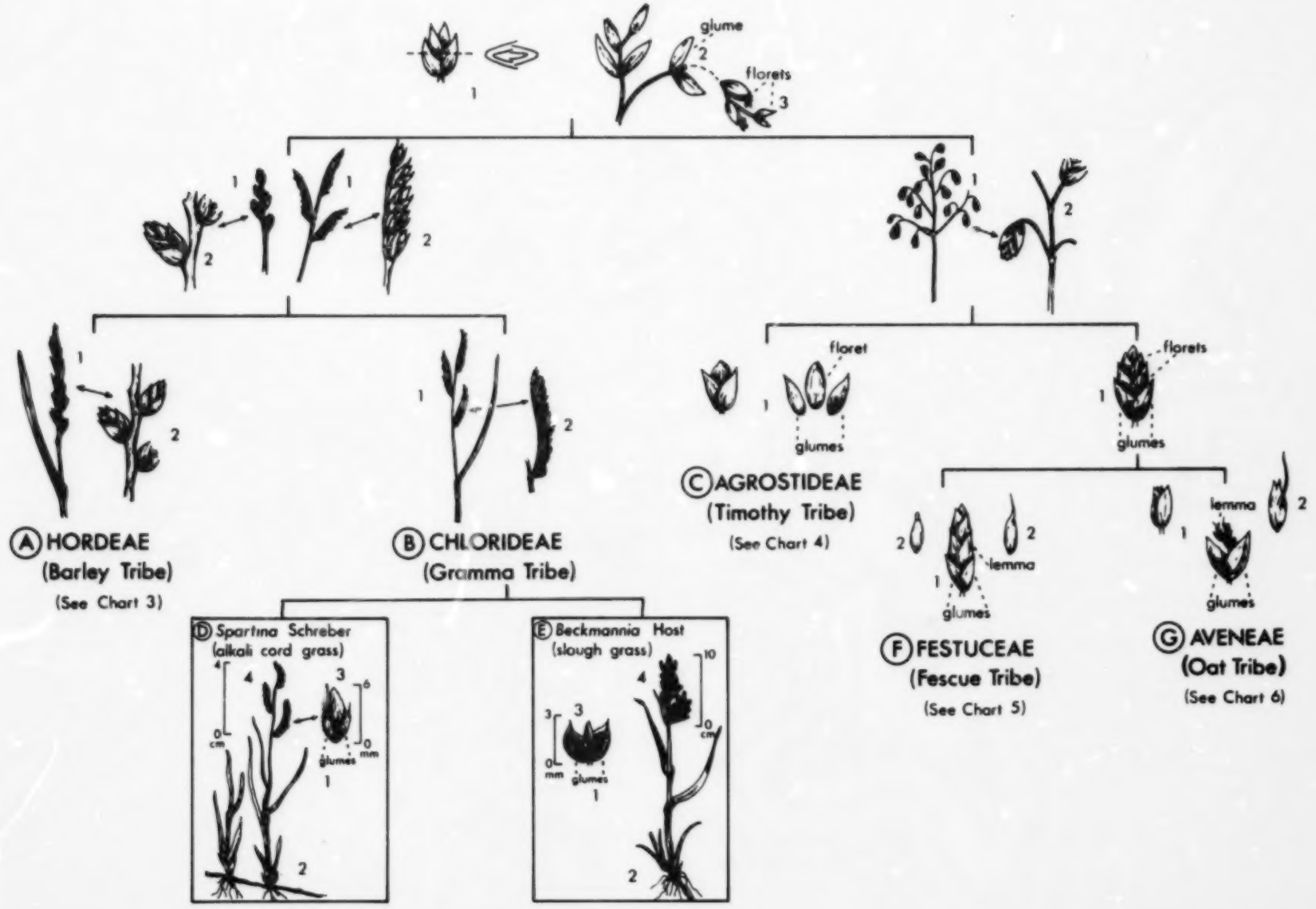
Ⓕ FESTUCEAE
(Fescue Tribe)
(see Chart 5)

1. Outer pair of scales of spikelets (glumes) usually equal to or longer than third scale (which belongs to first floret = 1st lemma)
2. Inner scales of spikelets (lemmas) with a slender stiff bristle (awn) arising from the back.

Ⓖ AVENEAE
(Oat Tribe)
(see Chart 6)

* Defined in the Glossary (page 15)

CHART 2
FESTUCOIDEAE (Fescue Subfamily)



Ⓐ HORDEAE
(Barley Tribe)
(See Chart 3)

Ⓑ CHLORIDEAE
(Gramma Tribe)

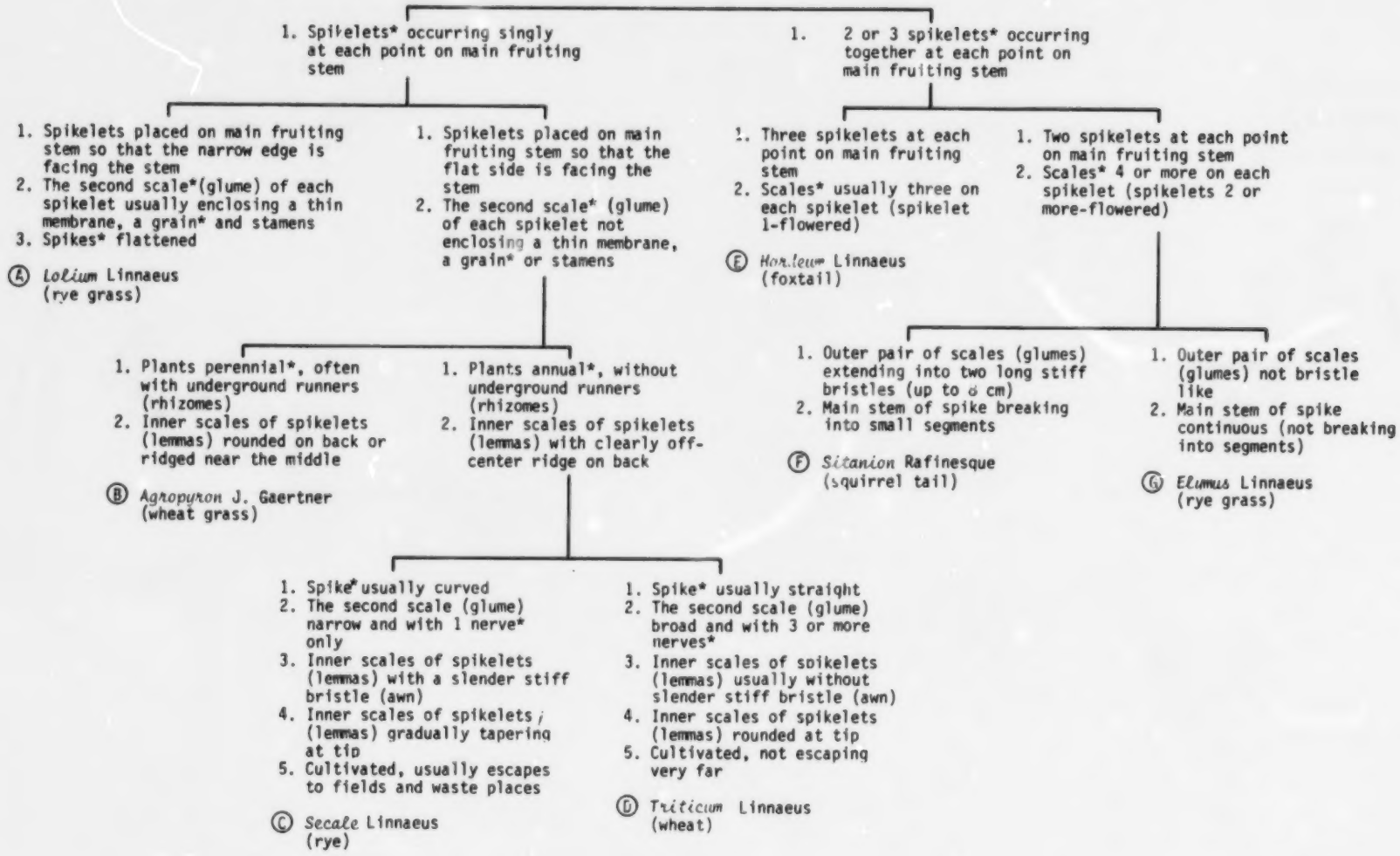
Ⓒ AGROSTIDEAE
(Timothy Tribe)
(See Chart 4)

Ⓕ FESTUCEAE
(Fescue Tribe)
(See Chart 5)

Ⓖ AVENEAE
(Oat Tribe)
(See Chart 6)

CHART 3

HORDEAE
(Barley Tribe)


1. Spikelets* occurring singly at each point on main fruiting stem
1. 2 or 3 spikelets* occurring together at each point on main fruiting stem
1. Spikelets placed on main fruiting stem so that the narrow edge is facing the stem
2. The second scale*(glume) of each spikelet usually enclosing a thin membrane, a grain* and stamens
3. Spikes* flattened
Ⓐ Lolium Linnaeus (rye grass)
1. Spikelets placed on main fruiting stem so that the flat side is facing the stem
2. The second scale* (glume) of each spikelet not enclosing a thin membrane, a grain* or stamens
1. Three spikelets at each point on main fruiting stem
2. Scales* usually three on each spikelet (spikelet 1-flowered)
Ⓔ Hordeum Linnaeus (foxtail)
1. Two spikelets at each point on main fruiting stem
2. Scales* 4 or more on each spikelet (spikelets 2 or more-flowered)
1. Plants perennial*, often with underground runners (rhizomes)
2. Inner scales of spikelets (lemmas) rounded on back or ridged near the middle
Ⓑ Agropyron J. Gaertner (wheat grass)
1. Plants annual*, without underground runners (rhizomes)
2. Inner scales of spikelets (lemmas) with clearly off-center ridge on back
1. Outer pair of scales (glumes) extending into two long stiff bristles (up to 6 cm)
2. Main stem of spike breaking into small segments
Ⓕ Sitanion Rafinesque (squirrel tail)
1. Outer pair of scales (glumes) not bristle like
2. Main stem of spike continuous (not breaking into segments)
Ⓖ Elymus Linnaeus (rye grass)
1. Spike* usually curved
2. The second scale (glume) narrow and with 1 nerve* only
3. Inner scales of spikelets (lemmas) with a slender stiff bristle (awn)
4. Inner scales of spikelets (lemmas) gradually tapering at tip
5. Cultivated, usually escapes to fields and waste places
Ⓒ Secale Linnaeus (rye)
1. Spike* usually straight
2. The second scale (glume) broad and with 3 or more nerves*
3. Inner scales of spikelets (lemmas) usually without slender stiff bristle (awn)
4. Inner scales of spikelets (lemmas) rounded at tip
5. Cultivated, not escaping very far
Ⓓ Triticum Linnaeus (wheat)

* Defined in the Glossary (page 15)

CHART 3

HORDEAE
(Barley tribe)

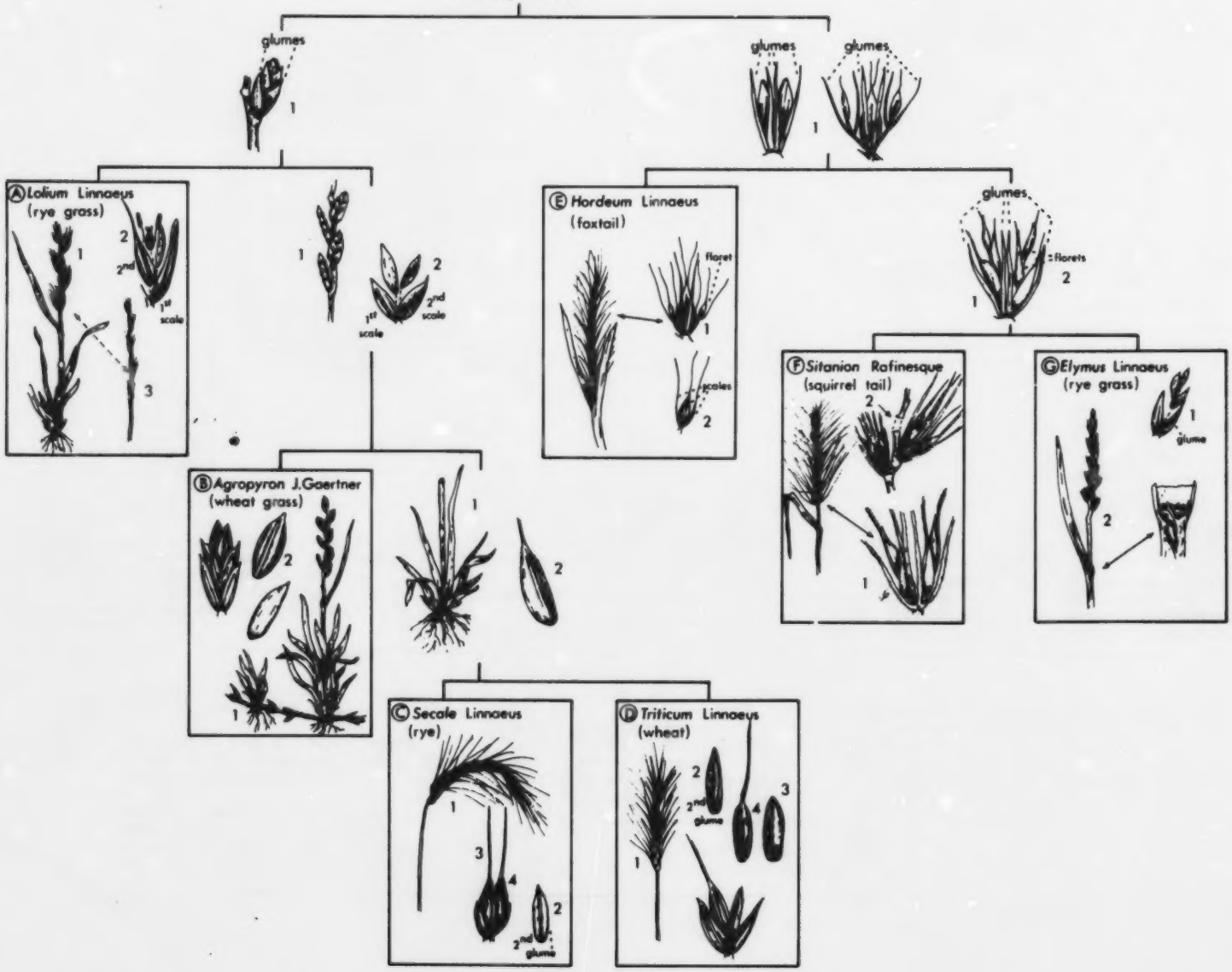


CHART 4

AGROSTIDEAE
(Timothy tribe)

1. Spikelets* grouped in dense, long or short cylindrical head
2. Outer pair of scales* (glumes) strongly ridged on back with hairs on ridge
3. Important cultivated grass growing in cultivated hay fields, roadsides or high elevation meadows

Ⓐ *Phleum* Linnaeus
(timothy)

1. Spikelets* not grouped in dense cylindrical head

1. Third scale*of spikelet (lemma) as thin or thinner than the outer pair of scales (glumes)
2. Third scale of spikelet (lemma) usually free from grain*

1. Third scale*of spikelet (lemma) clearly thicker and harder than the outer pair (glumes)
2. Third scale of spikelet (lemma) firmly enclosing thin inner membrane (palea) and the grain*

1. Stamen 1
2. Florets*raised on a short slender stem (barely visible with naked eye)
3. Spikelets break off below the outer pair of scales (glumes) so that these fall off with spikelets at maturity
4. Leaves flat
5. Plant growing in moist woods

Ⓑ *Cinna* Linnaeus
(wood grass)

1. Stamens mostly 3
2. Florets*not raised on a small stem
3. Spikelets break off above the outer pair of scales (glumes) so that these are left attached on the stem when the spikelets fall off at maturity

1. Edges of third scale (lemma) overlapping
2. Slender stiff bristle (awn) of inner scales (lemma) twice twisted and staying on at maturity
3. Outer pair of scales (glumes) narrow

Ⓕ *Stipa* Linnaeus
(needle grass)

1. Edges of third scale (lemma) not meeting or overlapping
2. Slender stiff bristle (awn) of inner scale (lemma), if present, may be twisted, but falling off at maturity
3. Outer pair of scales (glumes) broad

Ⓖ *Oryzopsis* A. Michaux
(rice grass)

1. Outer pair of scales of spikelet (glumes) not longer than the third scale (lemma)
2. Grain readily falling from spikelet
3. Leaves narrow
4. Plant growing in dry sand

Ⓒ *Sporobolus* R. Brown
(drop seed)

1. Outer pair of scales of spikelet (glumes) longer than third scale (lemma)
2. Grain not readily falling from spikelet
3. Leaves usually broad

1. The second scale of spikelet (glume) 1 nerved
2. Florets without tuft of hairs at base, if hairs present, then less than 1 mm long
3. Within each spikelet, stem is not usually extended into a short hairy bristle
4. Third scale (lemma) 3-nerved*

Ⓓ *Agrostis* Linnaeus
(bent grass)

1. The second scale of spikelet (glume) 3 nerved*
2. Florets with tuft of hairs at base (hairs more than 1 mm long)
3. Within each spikelet, stem is extended into a short hairy bristle
4. Third scale (lemma) 5-nerved

Ⓔ *Calamagrostis* Adanson
(pine grass, reed grass, blue joint)

* Defined in the Glossary (page 15)

CHART 4
AGROSTIDEAE
(Timothy tribe)

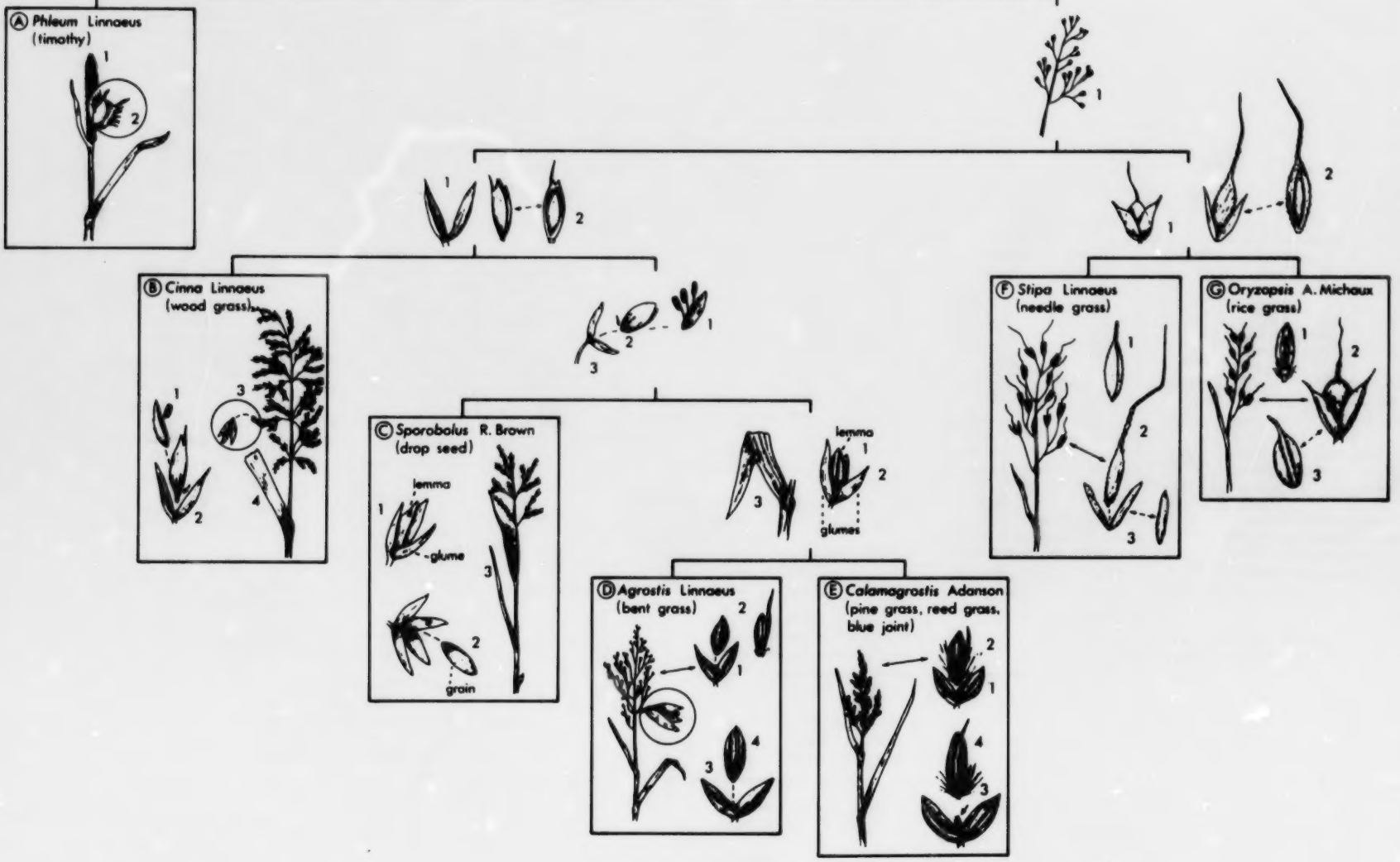
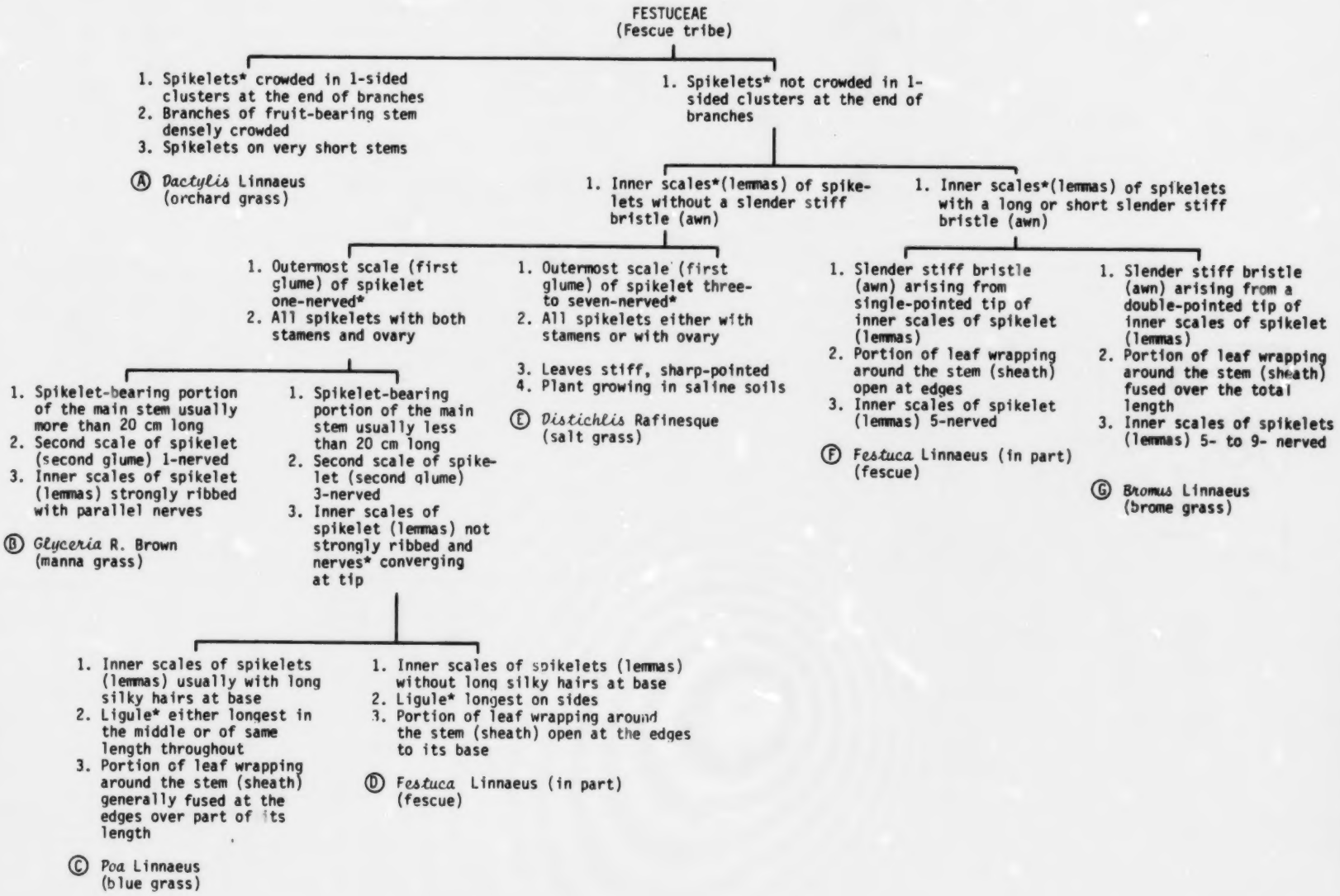


CHART 5


FESTUCEAE
(Fescue tribe)
1. Spikelets* crowded in 1-sided clusters at the end of branches
2. Branches of fruit-bearing stem densely crowded
3. Spikelets on very short stems
Ⓐ Dactylis Linnaeus (orchard grass)
1. Spikelets* not crowded in 1-sided clusters at the end of branches
1. Inner scales*(lemmas) of spikelets without a slender stiff bristle (awn)
1. Inner scales*(lemmas) of spikelets with a long or short slender stiff bristle (awn)
1. Outermost scale (first glume) of spikelet one-nerved*
2. All spikelets with both stamens and ovary
1. Outermost scale (first glume) of spikelet three- to seven-nerved*
2. All spikelets either with stamens or with ovary
3. Leaves stiff, sharp-pointed
4. Plant growing in saline soils
Ⓔ Distichlis Rafinesque (salt grass)
1. Slender stiff bristle (awn) arising from single-pointed tip of inner scales of spikelet (lemmas)
2. Portion of leaf wrapping around the stem (sheath) open at edges
3. Inner scales of spikelet (lemmas) 5-nerved
Ⓕ Festuca Linnaeus (in part) (fescue)
1. Slender stiff bristle (awn) arising from a double-pointed tip of inner scales of spikelet (lemmas)
2. Portion of leaf wrapping around the stem (sheath) fused over the total length
3. Inner scales of spikelets (lemmas) 5- to 9- nerved
Ⓖ Bromus Linnaeus (brome grass)
1. Spikelet-bearing portion of the main stem usually more than 20 cm long
2. Second scale of spikelet (second glume) 1-nerved
3. Inner scales of spikelet (lemmas) strongly ribbed with parallel nerves
Ⓑ Glyceria R. Brown (manna grass)
1. Spikelet-bearing portion of the main stem usually less than 20 cm long
2. Second scale of spikelet (second glume) 3-nerved
3. Inner scales of spikelet (lemmas) not strongly ribbed and nerves* converging at tip
1. Inner scales of spikelets (lemmas) usually with long silky hairs at base
2. Ligule* either longest in the middle or of same length throughout
3. Portion of leaf wrapping around the stem (sheath) generally fused at the edges over part of its length
Ⓒ Poa Linnaeus (blue grass)
1. Inner scales of spikelets (lemmas) without long silky hairs at base
2. Ligule* longest on sides
3. Portion of leaf wrapping around the stem (sheath) open at the edges to its base
Ⓓ Festuca Linnaeus (in part) (fescue)

* Defined in the Glossary (page 15)

CHART 5
FESTUCEAE
(Fescue tribe)

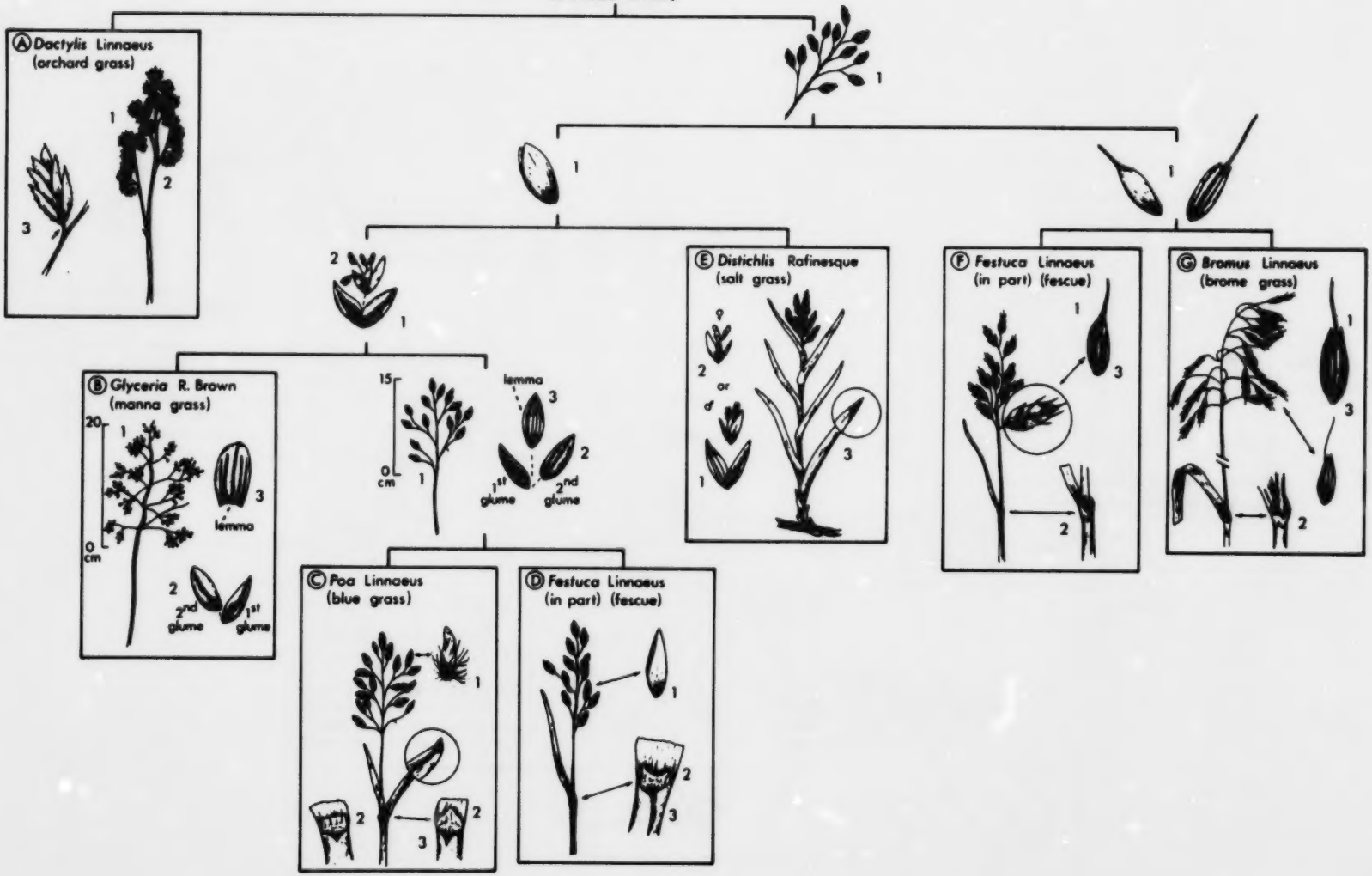


CHART 6

AVENEAE
(Oat tribe)

1. Inner scales*of spikelet* (lemmas) either without slender stiff bristles (awns) or with very short ones
2. Inner scales of spikelets (lemmas) not toothed at tip
3. Spikelets small (less than 1 cm long)

Ⓐ *Koeleria* Persoon
(June grass)

1. Inner scales*of spikelets* (lemmas) with distinct slender stiff bristles (awn)
2. Inner scales of spikelets (lemmas) 2-4-toothed at tip

1. Slender stiff bristles (awn) arising from back of inner scales of spikelet (lemmas)
2. Ligule* a membrane, present at the junction of leaf blade and portion of leaf that is wrapped around the stem (sheath)

1. Slender stiff bristle (awn) arising from between the teeth at tip of inner scales of spikelet (lemma)
2. Ligule* a tuft of hairs present at junction of leaf blade and portion of leaf that is wrapped around the stem (sheath)

Ⓔ *Danthonia* Lamarck & de Candolle
(oat grass)

1. Inner scales of spikelets (lemmas) 4-nerved
2. Tip of the inner scales of spikelets (lemma) not tapering to a point
3. Plant growing in meadows

Ⓑ *Deschampsia* Beauvois
(hair grass)

1. Inner scales of spikelet (lemmas) 5-9-nerved
2. Inner scales of spikelet (lemmas) tapering to a point

1. The outer pair of scales of spikelets (glumes) less than 10 mm long, unequal in length and 1-3-nerved
2. Slender stiff bristle (awn) arising from well above the middle of the inner scales of spikelet (lemmas)
3. Branching of fruit-bearing stem open to spike-like (spreading to compact)

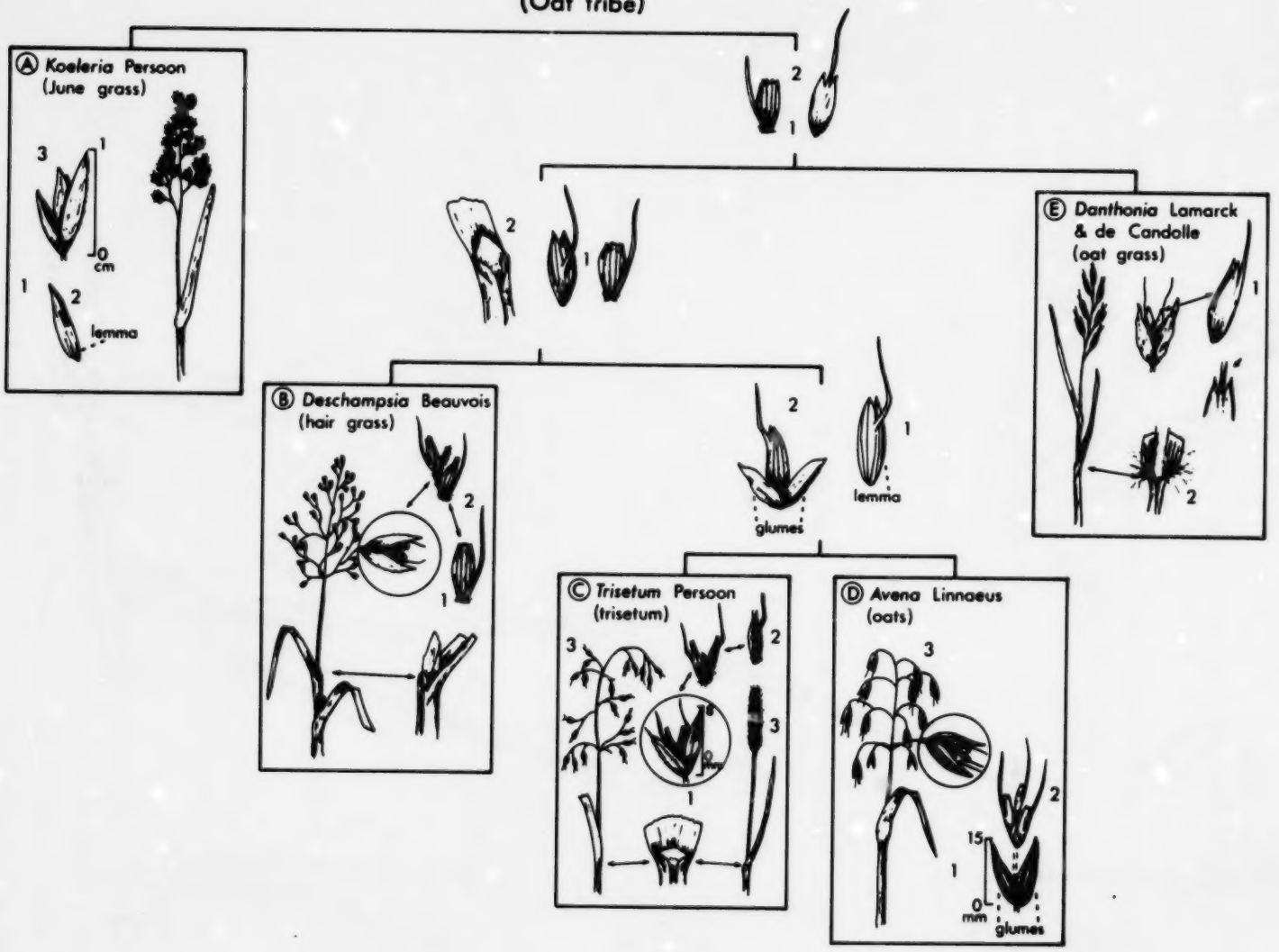
Ⓒ *Trisetum* Persoon
(trisetum)

1. The outer pair of scales of spikelets (glumes) more than 15 mm long almost equal in length and 5-9-nerved
2. Slender stiff bristle (awn) arising from near or below middle of the inner scales of spikelet (lemmas)
3. Branching of fruit-bearing stem open (spreading)

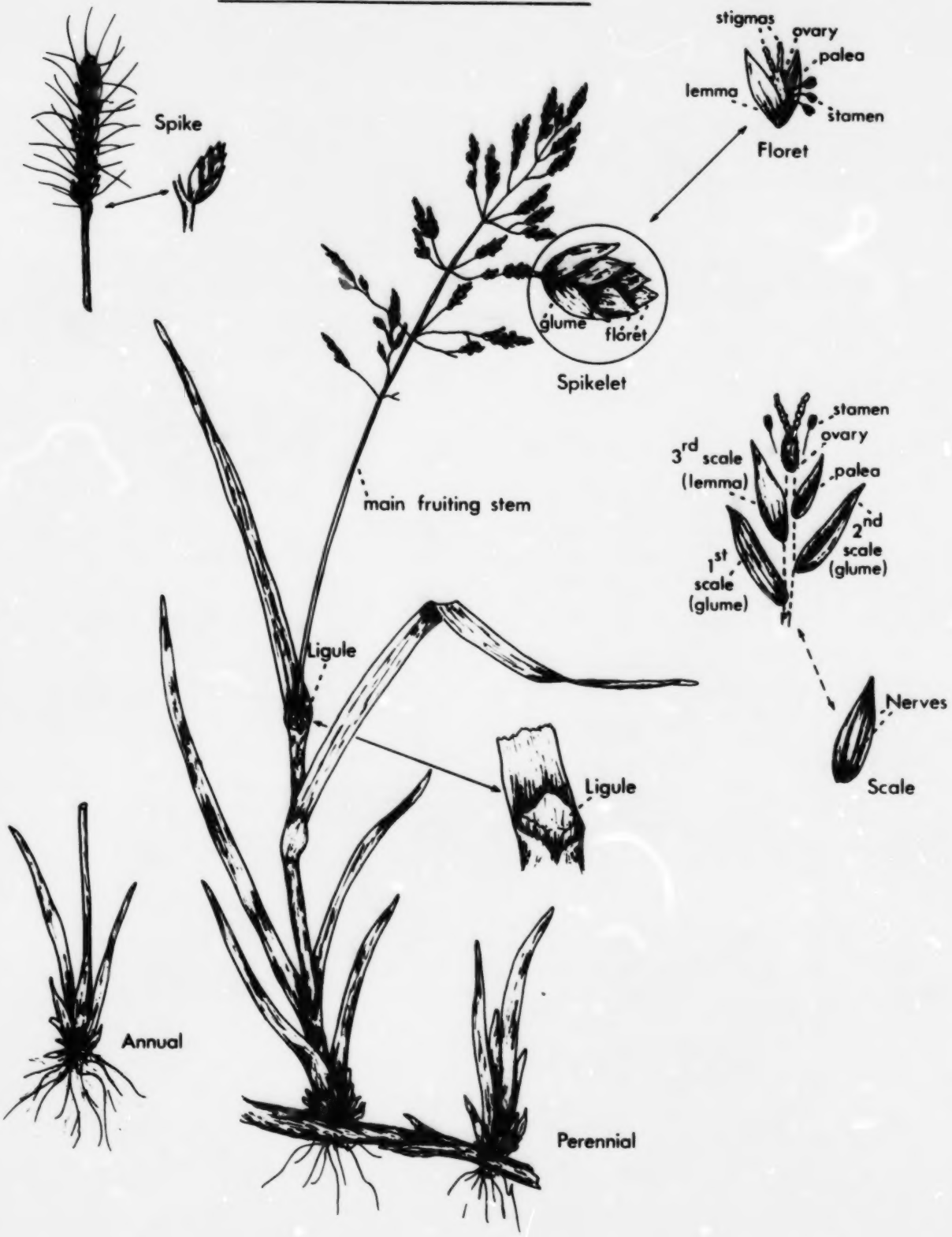
Ⓓ *Avena* Linnaeus
(oats)

* Defined in the Glossary (page 15)

CHART 6
AVENEAE
(Oat tribe)



ILLUSTRATED GLOSSARY OF TERMS



GLOSSARY OF TERMS

annual - plant living for one growing season only {usually with fibrous (thread-like) roots}

biennial - plant living for two growing seasons {may have fibrous (thread-like) roots or underground rooting stems (rhizomes)}

floret - a single flower, typically consisting of 3 stamens and 1 ovary with 2 feathery stigmas, all of which are enclosed by the 3rd (lemma) and 4th scale, a thin membrane (palea) or following pairs of scales.

glume - 1st or 2nd scale at the base of spikelet, sometimes small and bristle-like

grain - fruit (or "seed") of grass

lemma - 3rd scale of spikelet, at the base of the floret (1st scale of the floret)

ligule - the thin membrane or tuft of hairs at the junction of the leaf blade and the portion of the leaf wrapped around the stem (sheath)

nerve - the veins in the grass scales (appearing as fine lines on scale)

palea - generally the 4th scale and similar thin membranous scales of the spikelet, at the base of the floret (2nd scale of the floret)

perennial - plant living through three or more growing seasons (often with underground rooting stems - rhizomes)

scale - the small leaf-like structures at the base of the floret and spikelet. The 1st and 2nd scales (glumes) are at the base of the spikelet, the 3rd and membranous 4th scale and similar sets of scales (lemma and palea) are the base of each floret.

spike - spikelets attached directly to the main fruiting stem (rachis), and arranged in a more or less compact group

spikelet - a unit of the flowering portion of the grass, consisting of 1 or more stalkless florets, at the base of which are the 1st and 2nd scales (glumes)

vascular plants - a division of the plant kingdom including ferns and fern allies, and the seed-bearing plants, but excluding mosses, liverworts, algae, and fungi; the term vascular refers to the system of more or less woody ducts in the higher plants used for transporting sap

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AN ILLUSTRATED KEY TO GYMNOSPERMS

OF BRITISH COLUMBIA

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illustrated by G.F. Harcombe

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF ENVIRONMENT
(Terrestrial Studies Branch)

and

MINISTRY OF THE PROVINCIAL SECRETARY
AND GOVERNMENT SERVICES
Provincial Secretary
(British Columbia Provincial Museum)

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INTRODUCTION

This is one of a series of keys to the vascular plants of British Columbia (excluding ferns and fern allies). Other keys in this series are: An Illustrated Key to the Dicotyledon Families of British Columbia, An Illustrated Key to Monocotyledon Families of British Columbia, and An Illustrated Key to Common Grass Genera of the Festucoideae (Fescue Subfamily) of British Columbia. Plants bearing seeds are divided by botanists into the flowering plants and the conifers, and this key carries identification of the conifers to the species level. The conifer key is designed for the instruction of, and field use by, persons interested in expanding their botanical knowledge, and will serve as a practical introduction to more complex keys of formal manuals.

The key initially points to major groups of conifers, each of which is treated separately leading to the genera. The key uses pairs of contrasting characteristics at each step, and each step in the written key is accompanied by a drawing on the illustrated chart. Following through the key step by step, one will arrive at a genus and species name. The species are arranged in alphabetical order, and are described and illustrated in more detail on pages immediately following each chart. With the aid of the written and illustrated description, identification should not be difficult.

The names for the conifer species follow the conventions of Taylor and MacBryde (1977). The names printed in italics are the botanical genus name, species name, or variety, and the name following is the authority who named the plant and provided a formal description of the species or variety:

Eg.	*Pinus*	*contorta*	Dougl. var.	*latifolia*	Engelm.
	↑	↑	↑	↑	↑
	genus	species	authority	variety	authority

In the charts and the corresponding illustrations, circled letters serve to:

- relate the text in the chart to the appropriate drawing
- arrive at specific groups of plants in any of the charts with the aid of the index
- refer to more detailed drawings on the following pages

The authors have used their experience in field identification to judge which features were easily observed and useful for the identification of plants. Wherever possible, preference is given to vegetative features. Technical jargon is kept to a minimum.

ACKNOWLEDGEMENTS:

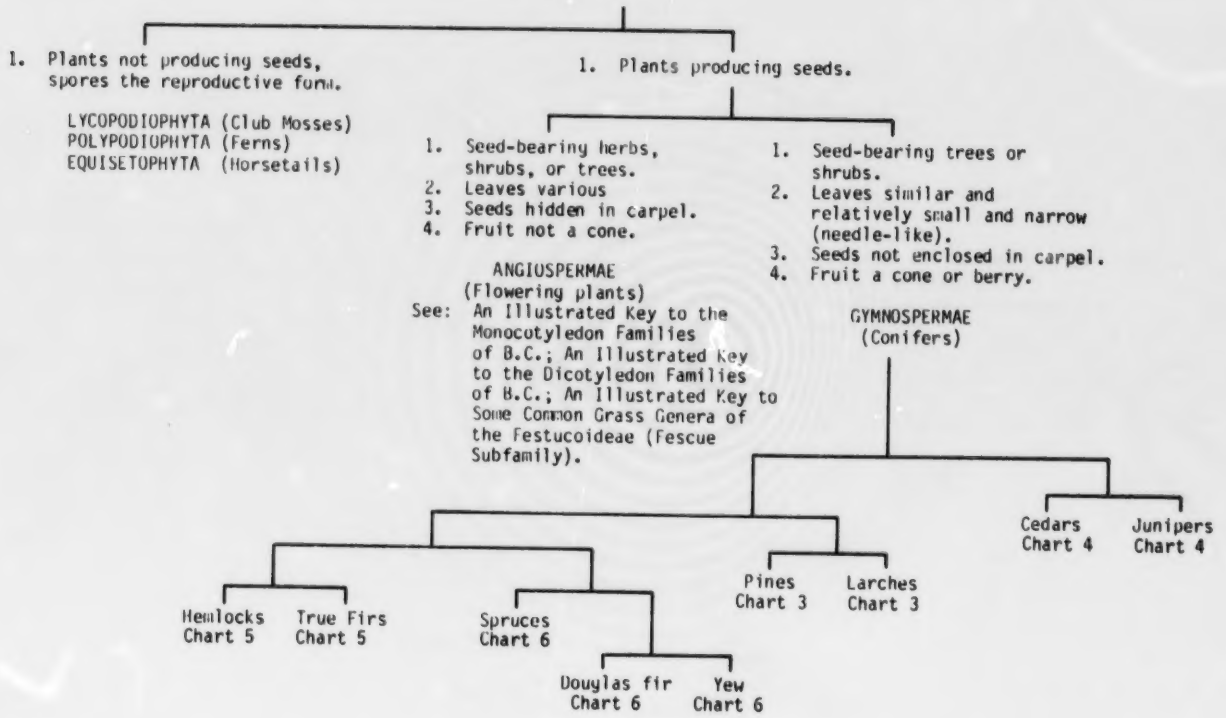
The authors are grateful to Mr. P.N. Sprout, under whose inspiring direction this project was conceived. We are grateful to Dr. J. Owens for his constructive criticism of the illustrations of this work. Valuable contributions were also made by the members of the editorial committee, and L.J. Houston, S. Mitchell, and A.P. Harcombe.

Editorial Committee:

W.A. Benson, C.M. Redmond, R.H. Reid, and the authors.

CHART 1

VASCULAR PLANTS *


1. Plants not producing seeds, spores the reproductive unit.
LYCOPODIOPHYTA (Club Mosses)
POLYPODIOPHYTA (Ferns)
EQUISETOPHYTA (Horsetails)
1. Plants producing seeds.
1. Seed-bearing herbs, shrubs, or trees.
2. Leaves various
3. Seeds hidden in carpel.
4. Fruit not a cone.
ANGIOSPERMAE
(Flowering plants)
See: An Illustrated Key to the Monocotyledon Families of B.C.; An Illustrated Key to the Dicotyledon Families of B.C.; An Illustrated Key to Some Common Grass Genera of the Festucoideae (Fescue Subfamily).
1. Seed-bearing trees or shrubs.
2. Leaves similar and relatively small and narrow (needle-like).
3. Seeds not enclosed in carpel.
4. Fruit a cone or berry.
GYMNOSPERMAE
(Conifers)
Hemlocks Chart 5
True Firs Chart 5
Spruces Chart 6
Douglas fir Chart 6
Yew Chart 6
Pines Chart 3
Larches Chart 3
Cedars Chart 4
Junipers Chart 4

*vascular plants - a division of the plant kingdom including ferns and fern allies, and the seed-bearing plants, but excluding mosses, liverworts, algae, and fungi; the term vascular refers to the system of more or less woody ducts in the higher plants used for transporting sap

CHART 2

GYMNOSPERMAE

1. Needle or scale-leaved evergreen trees or shrubs (if deciduous then needles in groups of more than ten).
2. Fruit a woody cone or a berry.

- 1. Trees with needles, needles usually more than 1 cm long.
  2. Fruit a woody cone (more than 1.3 cm long) or a fleshy berry with a pore at top.
  - 1. Needles in groups of two, three, five, or more than ten.

    See Chart 3
  - 1. Needles single.
    - 1. Needles blunt, not sharply pointed.

      See Chart 5
    - 1. Needles pointed at tip.

      See Chart 6
- 1. Trees with short (less than 7 mm) leaves, either scale-like or narrowly triangular, tapering gradually from a broader base to a sharp point (awl-shaped), which are more or less pressed flat against the branch.
  2. Fruit a berry or small cone, (about 1.3 cm long).

  See Chart 4

GYMNOSPERMAE

CHART 2

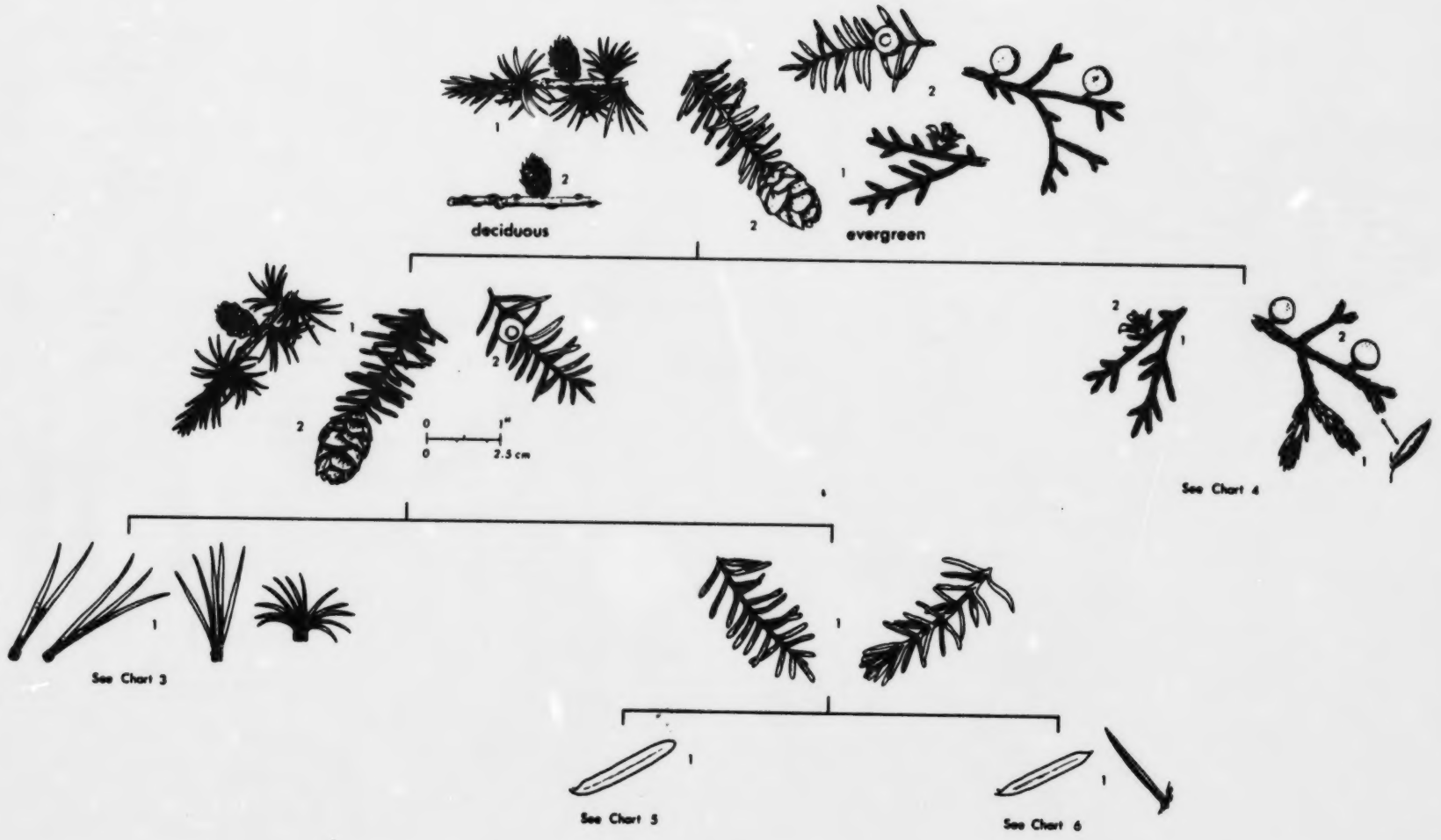


CHART 3

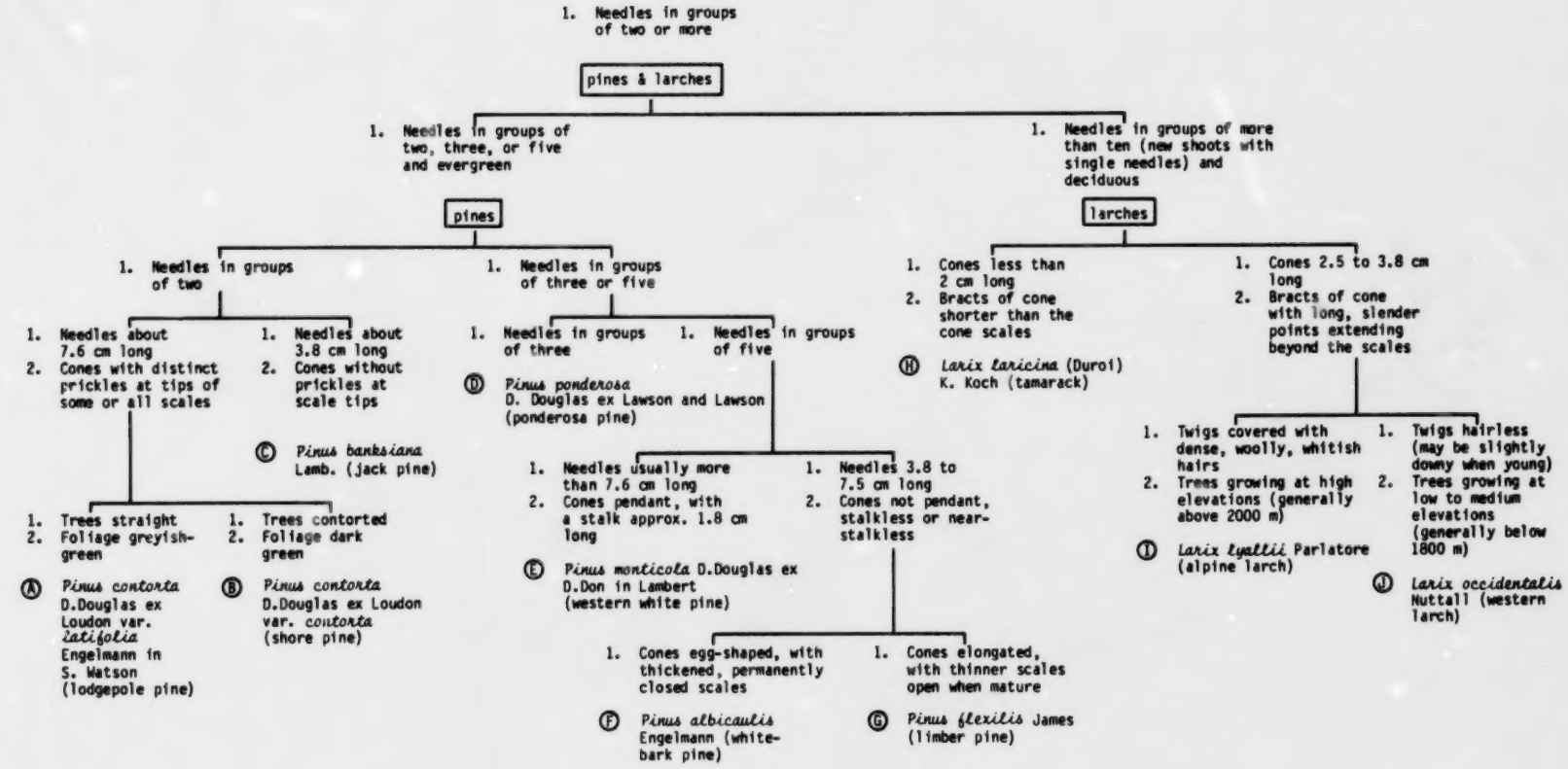
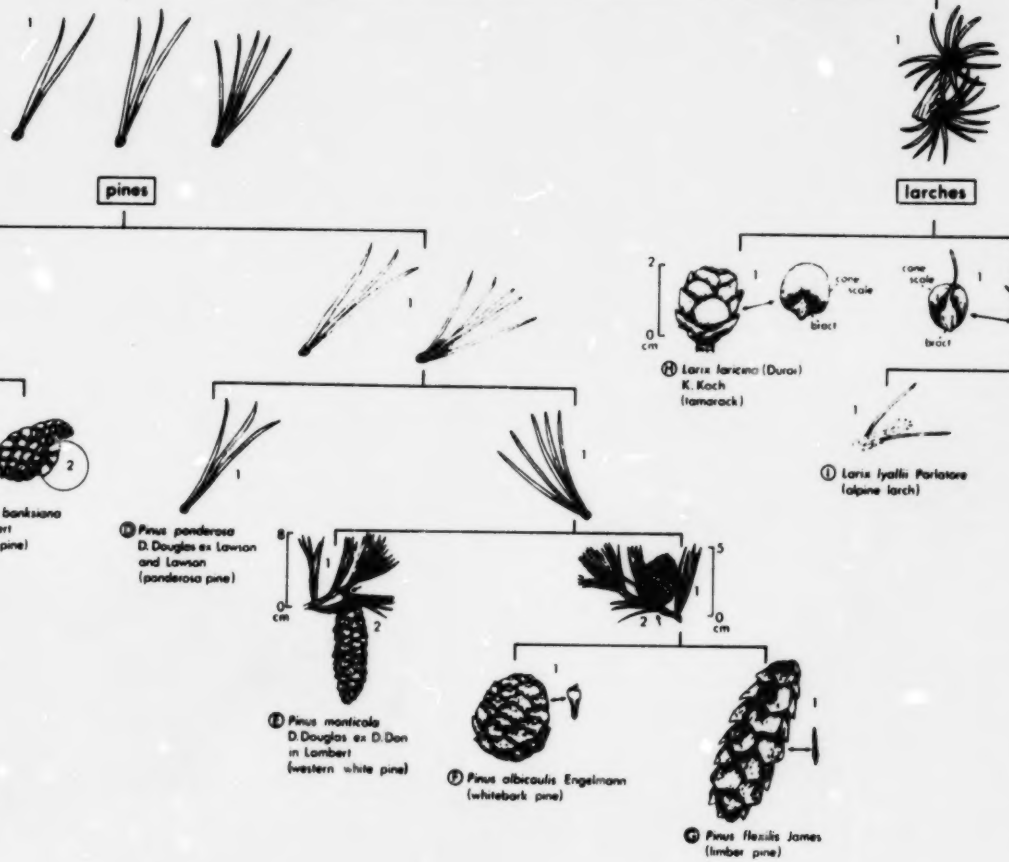

1. Needles in groups of two or more
pines & larches
1. Needles in groups of two, three, or five and evergreen
1. Needles in groups of more than ten (new shoots with single needles) and deciduous
pines
larches
1. Needles in groups of two
1. Needles in groups of three or five
1. Cones less than 2 cm long
2. Bracts of cone shorter than the cone scales
1. Cones 2.5 to 3.8 cm long
2. Bracts of cone with long, slender points extending beyond the scales
1. Needles about 7.6 cm long
2. Cones with distinct prickles at tips of some or all scales
1. Needles about 3.8 cm long
2. Cones without prickles at scale tips
1. Needles in groups of three
1. Needles in groups of five
Ⓗ Larix laricina (Duroi) K. Koch (tamarack)
1. Twigs covered with dense, woolly, whitish hairs
2. Trees growing at high elevations (generally above 2000 m)
1. Twigs hairless (may be slightly downy when young)
2. Trees growing at low to medium elevations (generally below 1800 m)
1. Trees straight
2. Foliage greyish-green
1. Trees contorted
2. Foliage dark green
Ⓒ Pinus banksiana Lamb. (jack pine)
Ⓓ Pinus ponderosa D. Douglas ex Lawson and Lawson (ponderosa pine)
1. Needles usually more than 7.6 cm long
2. Cones pendant, with a stalk approx. 1.8 cm long
1. Needles 3.8 to 7.5 cm long
2. Cones not pendant, stalkless or near-stalkless
Ⓘ Larix lyallii Parlatore (alpine larch)
Ⓙ Larix occidentalis Nuttall (western larch)
Ⓐ Pinus contorta D.Douglas ex Loudon var. latifolia Engelmann in S. Watson (lodgepole pine)
Ⓑ Pinus contorta D.Douglas ex Loudon var. contorta (shore pine)
Ⓔ Pinus monticola D.Douglas ex D.Don in Lambert (western white pine)
1. Cones egg-shaped, with thickened, permanently closed scales
1. Cones elongated, with thinner scales open when mature
Ⓕ Pinus albicaulis Engelmann (white-bark pine)
Ⓖ Pinus flexilis James (limber pine)

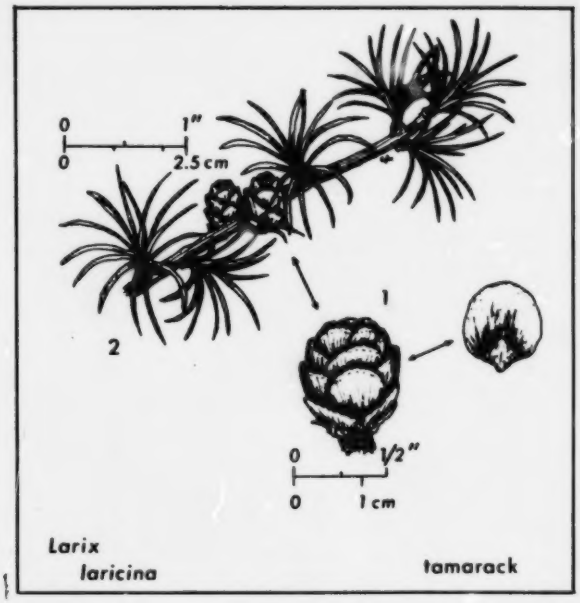
CHART 3

pines and larches

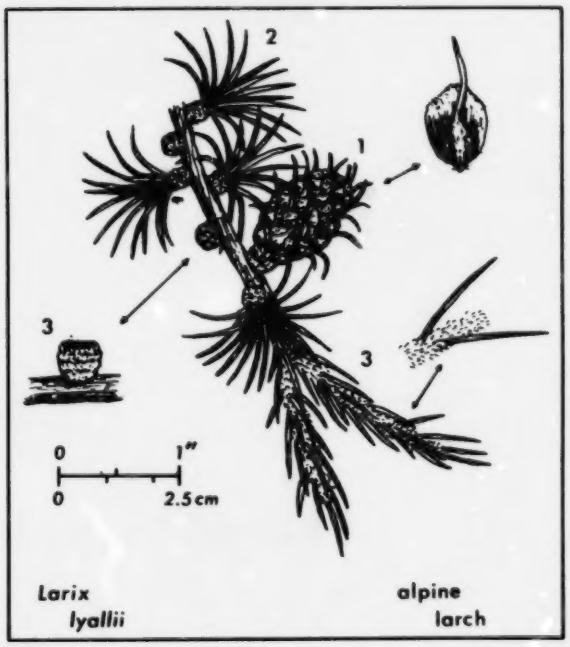
pines

larches

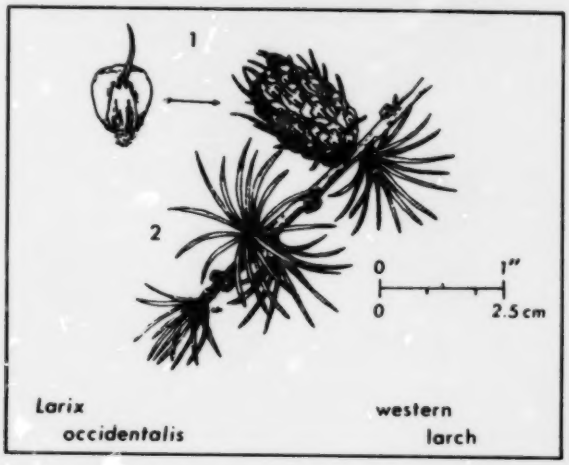

Ⓐ Pinus contorta D.Douglas ex Loudon var. latifolia Engelmann in S.Watson (lodgepole pine)
Ⓑ Pinus contorta D.Douglas ex Loudon var. contorta (shore pine)
Ⓒ Pinus banksiana Lambert (jack pine)
Ⓓ Pinus ponderosa D.Douglas ex Lawson and Lawson (ponderosa pine)
Ⓔ Pinus monticola D.Douglas ex D.Don in Lambert (western white pine)
Ⓕ Pinus albicaulis Engelmann (whitebark pine)
Ⓖ Pinus flexilis James (limber pine)
Ⓗ Larix laricina (Duroi) K.Koch (tamarack)
Ⓘ Larix lyallii Parlatore (alpine larch)
Ⓙ Larix occidentalis Nuttall (western larch)
cone scale
bract



Ⓗ *Larix laricina* (Duroi) K. Koch
(tamarack)
1-Cones almost spherical 1.3 to 2.5 cm long.
2-Needles 1.8 to 3.2 cm long, light green, in clusters of 10-20 on older twigs.
3-Tree usually small and stunted.
4-Bark thin, smooth, bluish-grey on young trees. On old trees, consisting of many curved-out, hard scales.
5-In northwestern B.C., north of Peace River, generally in boggy areas.

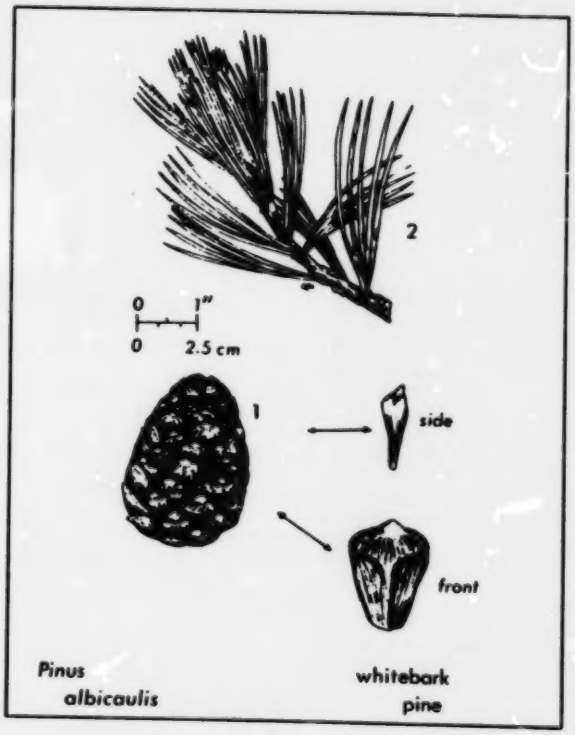


① *Larix lyallii* Parlatore
(alpine larch)
1-Cones elongate, approximately 2.5 cm long, 1.5 to 2 times longer than wide.
2-Needles 2.5 to 3.8 cm long, pale blue-green, in brush-like cluster of 30-40 on older twigs.
3-Tree small, often stunted and conical in shape. Foliage light to greyish-yellow-green. Dwarf shoots .3 to .9 cm long with distinct soft hairs on young twigs and cone scales. Buds often almost hidden with whitish hairs on scale edges.
4-Bark thin dark-greyish-brown in the longitudinal cracks and on exposed surfaces.
5-At high elevations, generally above 2000 m.



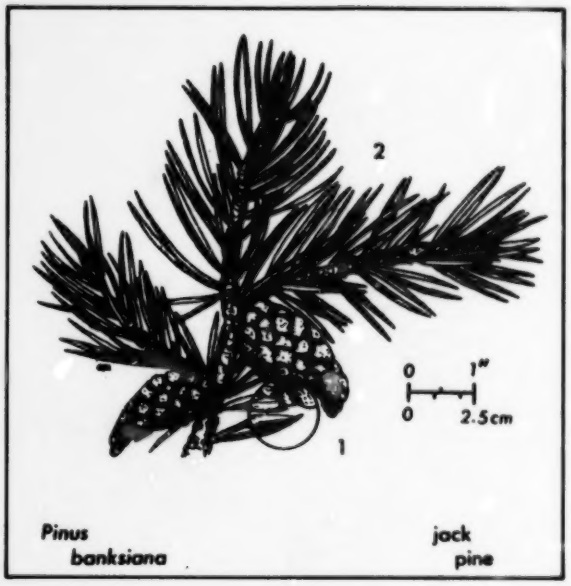
(J) *Larix occidentalis* Nuttall
(western larch)

1-Cones less than 3.8 cm long, yellowish-brown when mature. Scales usually covered on lower half with a dense coating of white hairs when young.
2-Needles less than 2.5 cm, in clusters of 14-30 on older twigs.
3-Tree of open yellowish-green foliage, usually somewhat cylindrical in form when mature.
4-Bark thick and reddish or brown and scaly.
5-Columbia and Montane Forest Regions east of the Okanagan Valley.

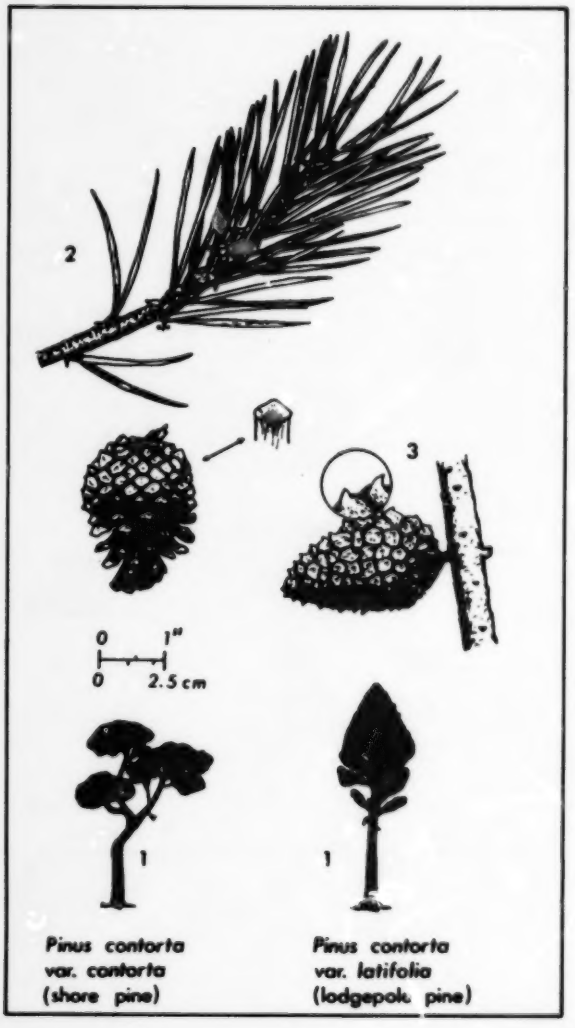


(I) *Pinus albicaulis* Engelmann
(whitebark pine)

1-Cones 3.8 to 10 cm long, purple, egg-shaped consisting of more or less fleshy scales (thickened); scales staying compressed, not open.
2-Needles 3.8 to 7.6 cm long, slightly curved.
3-Tree often somewhat stunted with open, firm, shiny dark-green foliage.
4-Bark on young stems thin, greyish, on old trees broken into narrow, plate-like scales.
5-Usually on exposed slopes, high elevation subalpine forests to timberline.

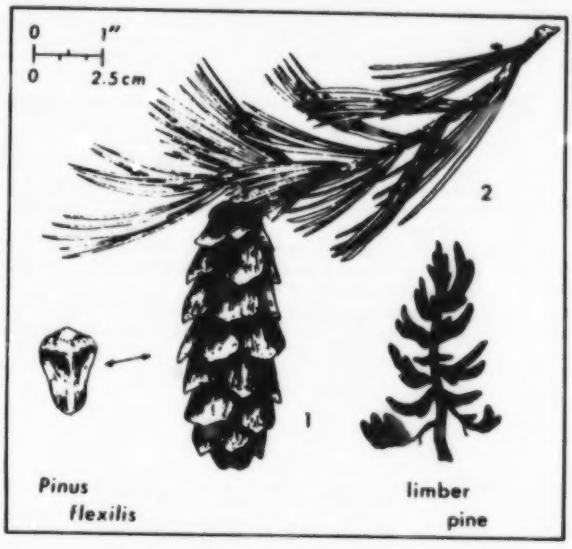


Ⓒ *Pinus banksiana* Lamb.
(jack pine)
1-Cones 2.5 to 5 cm long, often curved, asymetrical, without prickles at scale tips; cones hanging down from branch.
2-Needles approximately 3.8 cm long
3-Trees somewhat contorted.
4-Restricted to northeast (Peace River area).



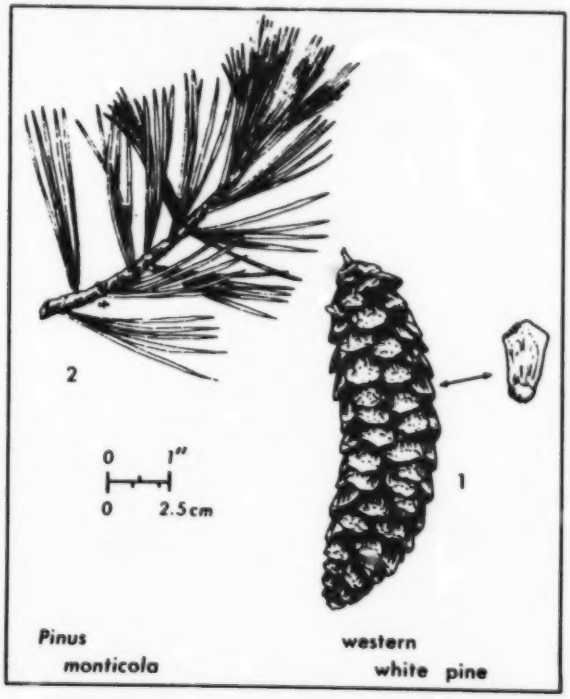
Ⓑ *Pinus contorta* D.Douglas ex Loudon
var. *contorta*
(shore pine)
1-Tree contorted.
2-Leaves dark green.
3-Cones similar to those of *Pinus contorta* var. *latifolia*
4-Bark similar to that of *Pinus contorta* var. *latifolia*
5-Restricted to coastal area.

Ⓐ *Pinus contorta* D.Douglas ex Loudon
var. *latifolia* Engelmann in S. Watson
(lodgepole pine)
1-Trees of relatively open foliage, tall and slender.
2-Needles about 7.6 cm; foliage greyish green.
3-Cones short (approximately 5 cm) with distinct sharp prickles at hardened scale tips; growing at right angles to branch.
4-Bark light-brown to dark-brown, finely cracked at the base of stem and somewhat more flakey over the remainder.
5-Throughout the Province, at all but alpine elevations and the dry valleys of Southern Interior.



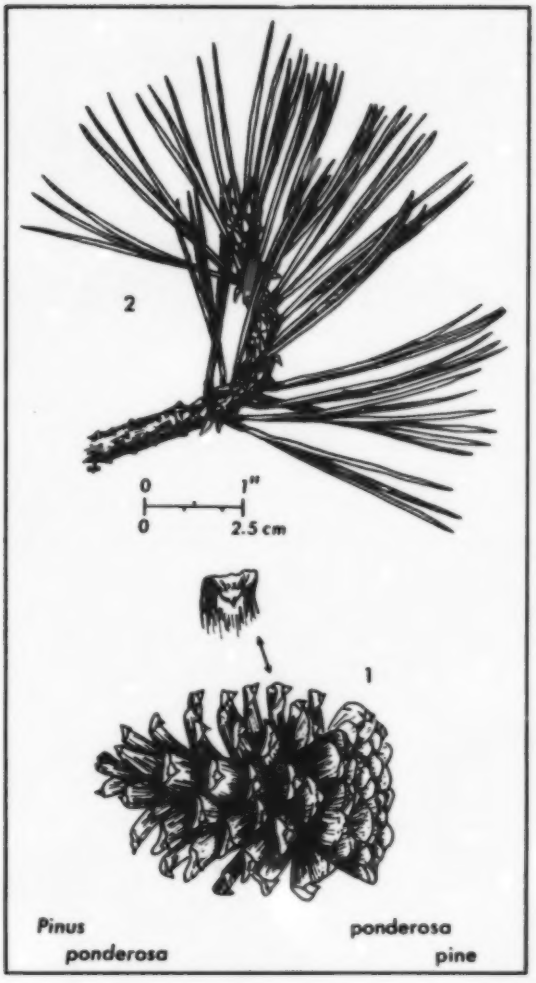
Ⓒ *Pinus flexilis* James
(limber pine)

1-Cones elongate, 7.6 to 20 cm long, golden brown, scales open on cone.
2-Needles 3.8 to 7.6 cm long, slightly curved yellow-green.
3-Tree small, with thick, usually crooked trunk and large uneven crown; branches tend to droop with tips upturned.
4-Bark on young stems smooth, grey or silvery-white, becoming rough, dark brown to almost black, deeply fissured into wide scaly plates.
5-Dry exposed slopes at mid to high elevations in the Rocky Mountains.



Ⓓ *Pinus monticola* D.Douglas ex D.Don in Lambert
(western white pine)

1-Cones elongate, usually more than 11.3 cm long, more than twice as long as broad, slightly curved.
2-Needles usually more than 10 cm long, silver-green and relatively slender.
3-Tree slender, often with distinct whorled branches, particularly in the upper parts, where the leader and the tips of branches often point upwards like candles.
4-Bark silvery-grey on young trees, becoming dark and deeply fissured on older trees to form a regular pattern of small, thick plates.
5-In interior wet belt and coastal forest.



Ⓓ *Pinus ponderosa* D. Douglas ex Lawson and Lawson. (ponderosa pine)

1-Cones more than 7.6 cm long and approximately 2/3 of length wide.
2-Needles usually more than 7.6 cm long.
3-Trees of somewhat open greyish-green foliage
4-Bark thick, with deep cracks, orange-brown in cracks and exposed surfaces, darker in colour when young.
5-Restricted to lower elevations of dry south central to southeastern portions of B.C.

CHART 4

1. Trees with short (less than 7 mm) leaves, either scale-like or narrowly triangular, tapering gradually from a broader base to a sharp point (awl-shaped), which are more or less pressed flat against the branch.
2. Fruit a berry or small cone, (about 1.3 cm long).

cedar and junipers

1. Fruit a green or more or less woody cone, with distinctly visible scales even when immature

cedars

1. Cone oval, with fan-shaped scales
2. Foliage yellow-green, pungent smelling when crushed

Ⓐ *Thuja plicata* Donn ex D.Don in Lambert (western red cedar)

1. Cones spherical, with conical scales
2. Foliage bluish-green, crushed foliage non-aromatic

Ⓑ *Chamaecyparus nootkatensis* (D.Don) Spach (yellow cedar)

1. Fruit a berry, bluish-black when mature, without a pore at top

junipers

1. Only young branches with short, prickly, scaly or awl-shaped leaves (narrowly triangular, tapering gradually from a broader base to a sharp point); older foliage of scale-like leaves, pressed flat against the branch

1. Young leaves awl-shaped (narrowly triangular), attached three in whorl
2. Generally a bushy shrub or small tree less than 6 m tall, with one to several stems giving a conical form

Ⓒ *Juniperus scopulorum* Sargent (Rocky Mountain juniper)

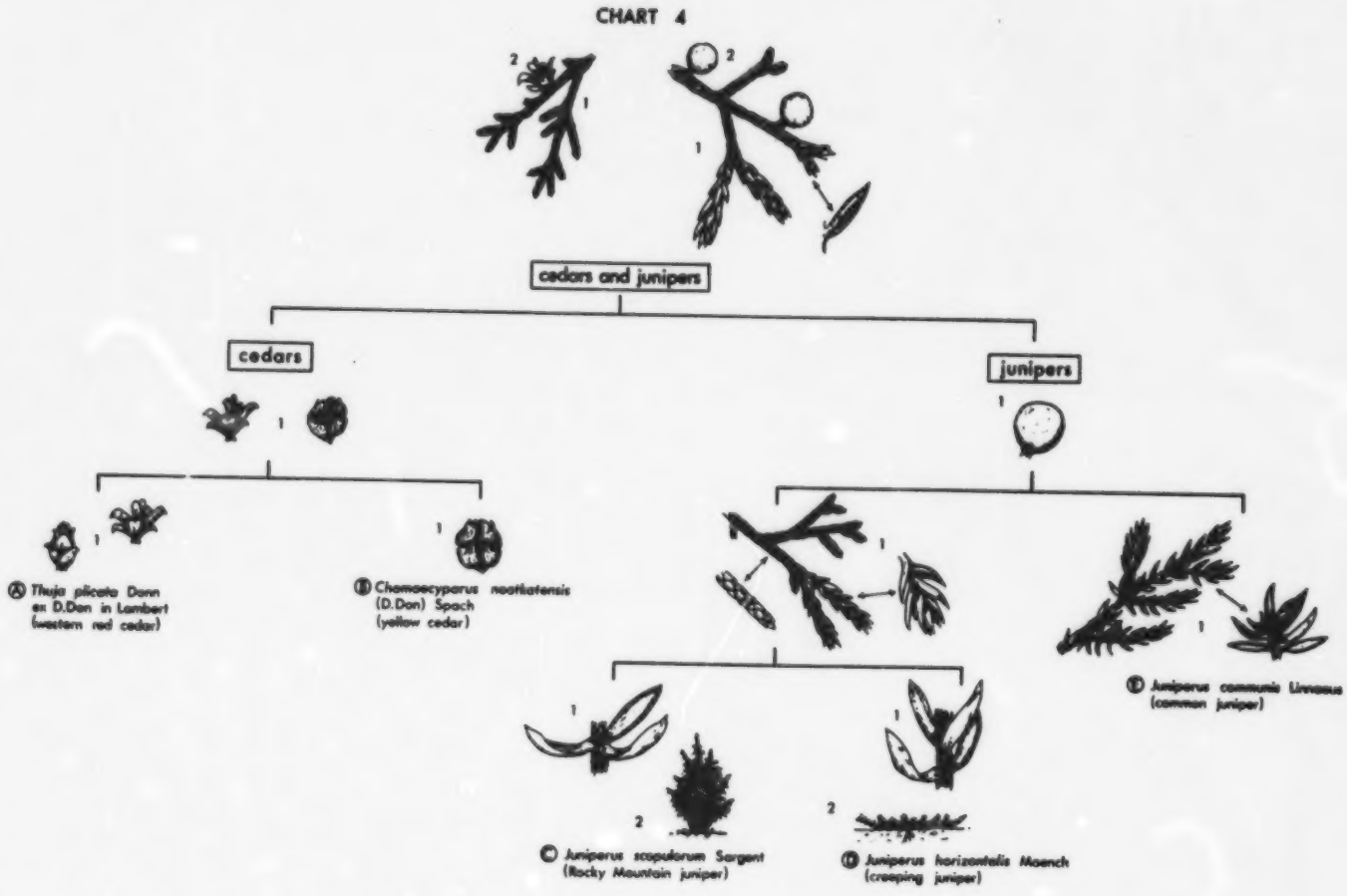
1. Young leaves awl-shaped (narrowly triangular), arranged in two's
2. Generally a low trailing shrub, never a tree

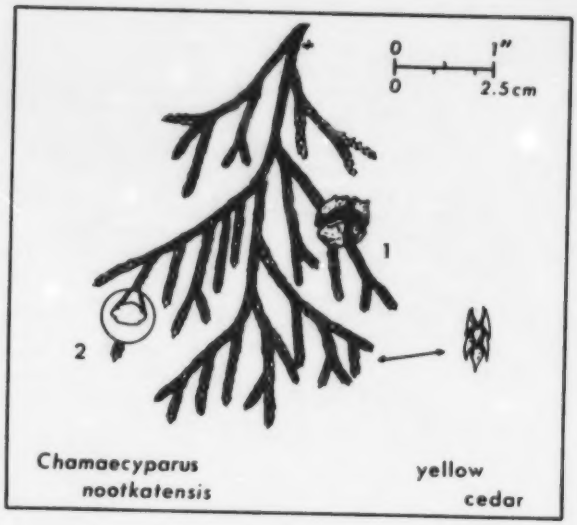
Ⓓ *Juniperus horizontalis* Moench (creeping juniper)

1. Both young and mature branches with prickly awl-shaped (narrowly triangular) leaves not pressed flat against the branch so young and mature foliage similar

Ⓔ *Juniperus communis* Linnaeus (common juniper)

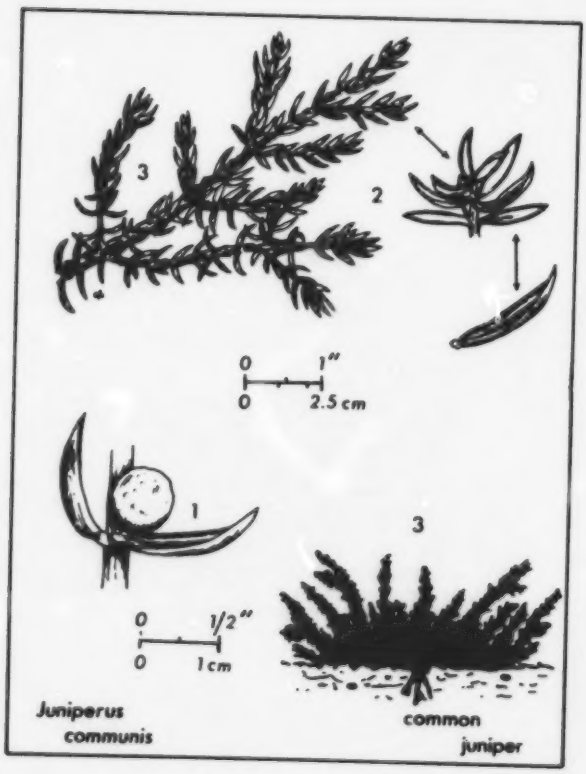
CHART 4


cedars and junipers
cedars
junipers
Ⓐ Thuja plicata Donn ex D.Don in Lambert (western red cedar)
Ⓑ Chamaecyparus nootkatensis (D.Don) Spach (yellow cedar)
Ⓒ Juniperus scopulorum Sargent (Rocky Mountain juniper)
Ⓓ Juniperus horizontalis Moench (creeping juniper)
Ⓔ Juniperus communis Linnaeus (common juniper)



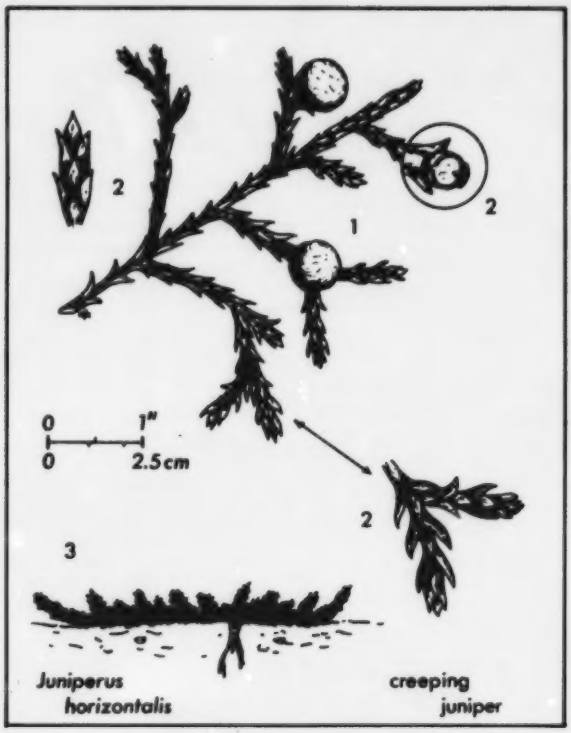
Ⓑ *Chamaecyparus nootkatensis* (D.Don) Spach
(yellow cedar)

1-Cones small (approximately 1.3 cm) spherical, with conical scales radiating from a central point.
2-Leaves scale-like, bluish-green, sharp-pointed, prickly to touch, in pairs, overlapping. Crushed foliage non-aromatic.
3-Bark greyish-brown with longitudinal intersecting cracks, not fibrous.
4-At coast and in the Slocan Valley (valley of Hird and Evans Lakes).

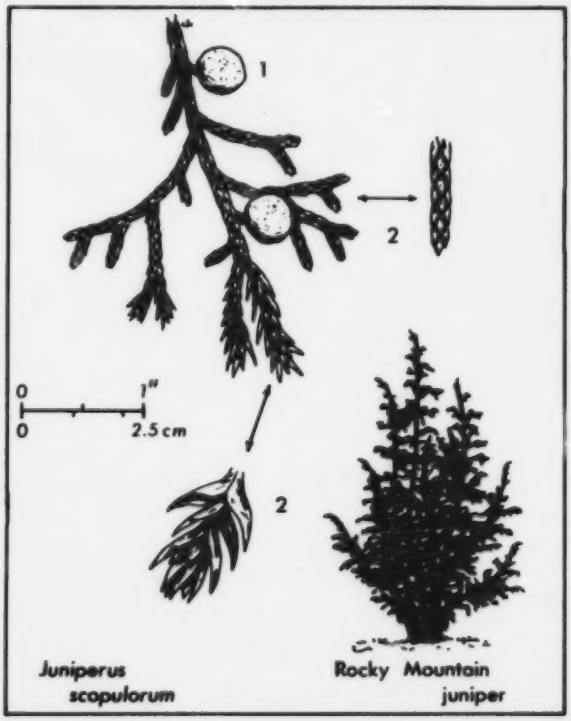


Ⓔ *Juniperus communis* Linnaeus
(common juniper)

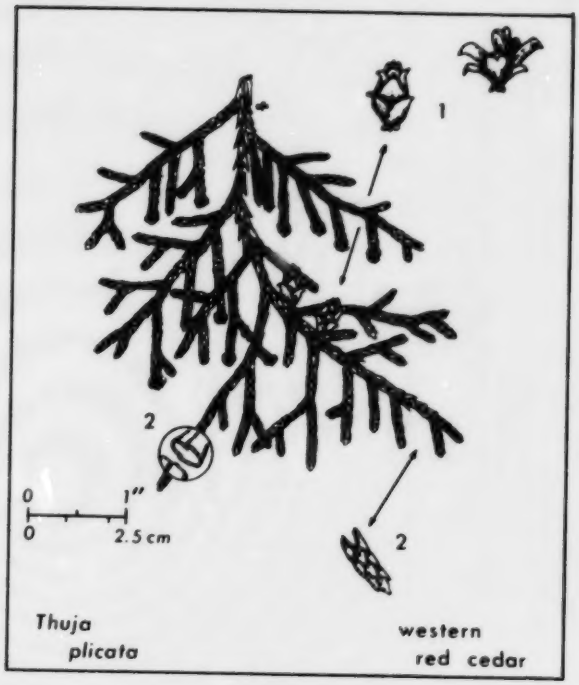
1-Fruit, a fleshy green to dark blue berry (when mature) usually with a distinct silvery bloom which rubs off.
2-Leaves prickly and awl-shaped, arranged in three's, not pressed flat against the branch, so branch prickly to the touch.
3-Shrub, often spreading over ground with the branches turned upward. Young and mature foliage similar.
4-Bark thin, reddish-grey and scaly.
5-Throughout B.C. at all elevations.



Ⓓ *Juniperus horizontalis* Moench
(creeping juniper)
1-Fruit a fleshy green to bluish-brown berry, with only a slight silvery bloom which rubs off.
2-Branches, when young, with very short (5-7 mm) prickly awl-shaped leaves, arranged in two's and curved upward, older foliage more scale-like, pressed flat against the branch, so branch relatively smooth to the touch.
3-Shrub, generally low and trailing, never a tree.
4-Bark reddish-grey.
5-Foothills and dry montane ridges, in central and southeastern B.C.



Ⓒ *Juniperus scopulorum* Sargent
(Rocky Mountain juniper)
1-Fruit fleshy green to dark-blue berry (when mature) lacking an opening at the end, usually with a distinct silvery bloom which rubs off.
2-Branches, when young, with short prickly scaly leaves, attached three in a whorl, somewhat curved upward. Older foliage of scale-like leaves, pressed flat against the branch, not prickly.
3-Shrub, generally bushy, or a small tree less than 6.2 m high, with one to several stems giving a conical form.
4-Bark thin, fibrous, red-brown to grey-brown, divided by shallow furrows.
5-In dry central and south interior, and dry habitats of the south coast.



Ⓐ *Thuja plicata* Donn ex D.Don in Lambert (western red cedar)

1-Cone oval, small, fan-shaped scales, not more than seven arising from a central axis.

2-Leaves overlapping and scale-like, blunt, in pairs, dark yellow-green. Crushed foliage pungent smelling.

3-Reddish-brown bark forming long fibrous shreds with a network of narrow intersecting ridges.

4-Throughout wet belt, coast and in moist areas of the interior.

CHART 5

1. Needles blunt, not sharp-pointed

hemlocks and true firs

hemlocks

1. Cones pendant and small
2. Needles rounded at tip
3. Bark rough

1. Cone egg-shaped, less than 2.5 cm long
2. Leaves flattened in cross section, appearing two-ranked

Ⓐ *Tsuga heterophylla* (Rafinesque) Sargent (western hemlock)

1. Cone cylindrical, more than 2.5 cm long
2. Leaves semi-circular in cross section, projecting out all around the twig

Ⓑ *Tsuga mertensiana* (Bongard) Carriere (mountain hemlock)

true firs

1. Cones upright and large
2. Needles usually notched at tip
3. Young bark smooth, with resin blisters

1. Leaves dark green above, whitish or with two silvery stripes on underneath only
2. Needles either all horizontally spreading or in part horizontally spreading, others pointing forward

1. Needles distinctly two-ranked (oriented in a flat plane)
2. Bark on mature trees 5 to 7.6 cm thick, furrowed into hard, reddish-brown ridges
3. Cones yellow-green

Ⓒ *Abies grandis* (Douglas ex D. Don) Lindley (grand fir)

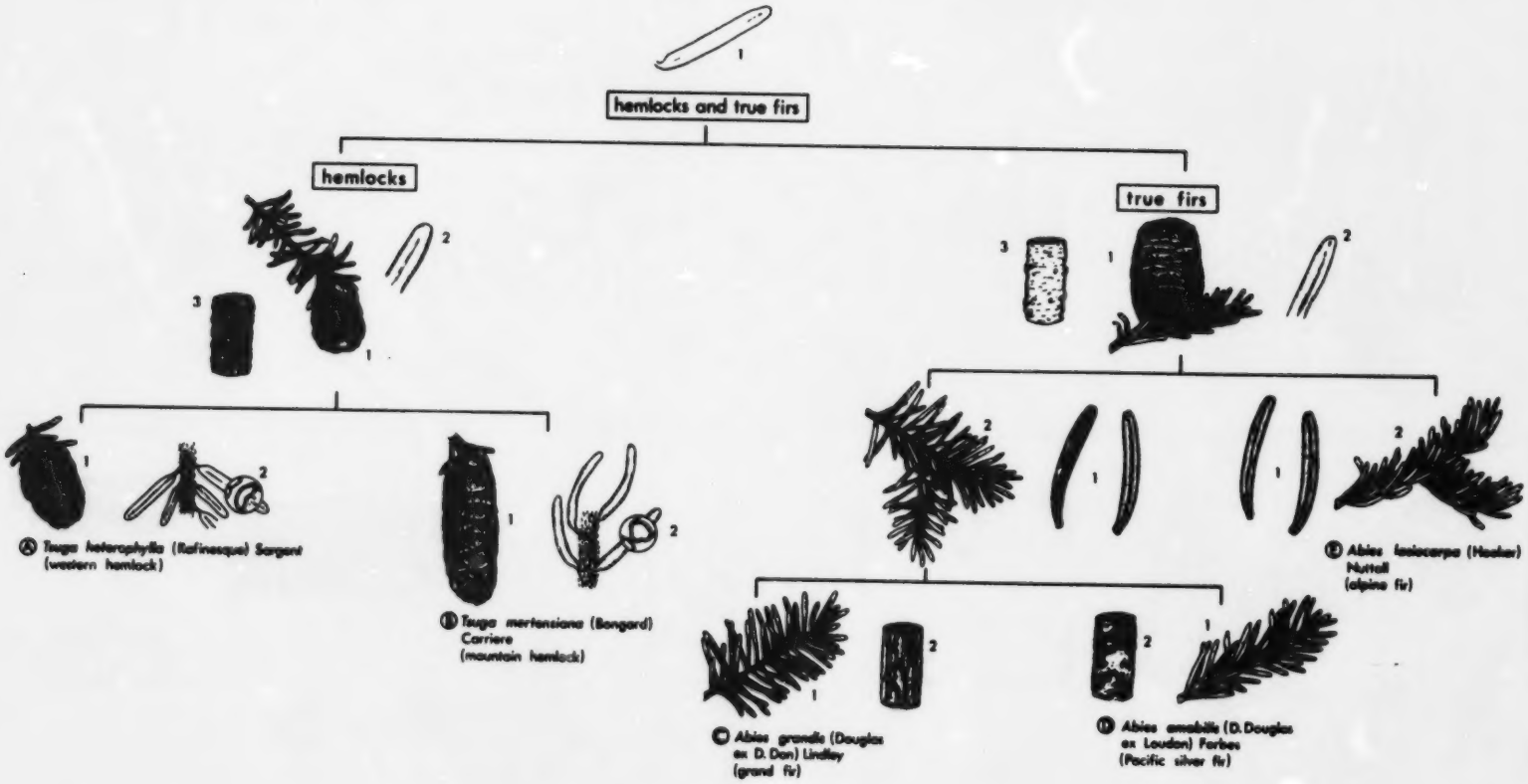
1. Needles mostly pointing forward, only a few horizontally spreading (leaves not distinctly two-ranked)
2. Bark on mature trees thin, pale or ash-grey with conspicuous chalky white patches
3. Cones dark purple

Ⓓ *Abies amabilis* (D.Douglas ex Loudon) Forbes (Pacific silver fir)

1. Leaves deep blue-green with silvery stripes on upper and lower surface
2. Needles usually curved upward (few, if any, horizontally spreading)

Ⓔ *Abies lasiocarpa* (Hooker) Nuttall (alpine fir)

CHART 5


1
hemlocks and true firs
hemlocks
true firs
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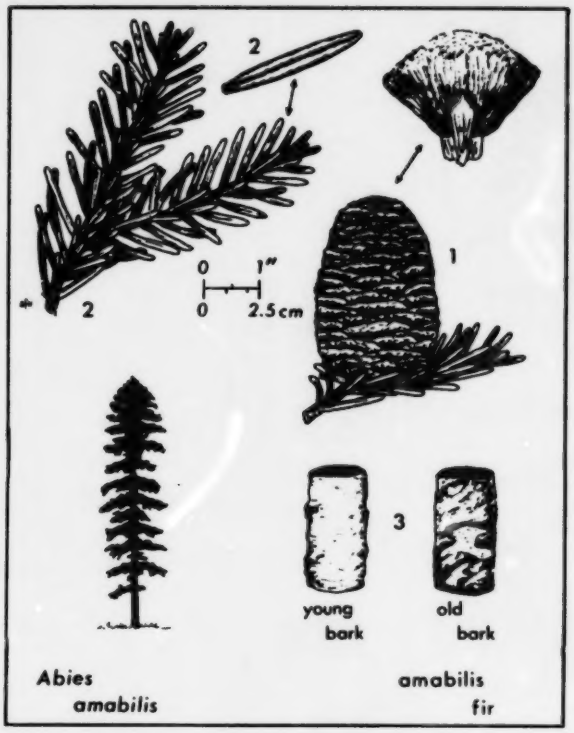
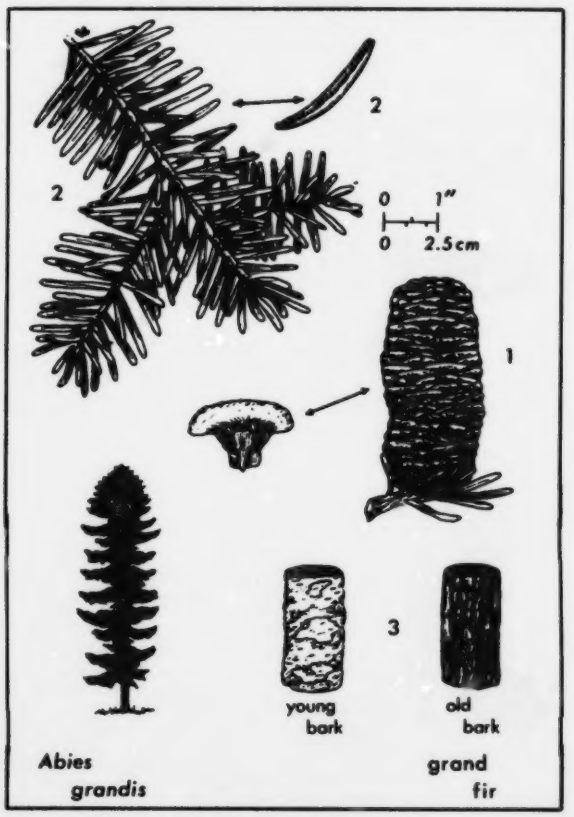
⑧ Tsuga heterophylla (Raf.inesque) Sargent
(western hemlock)
⑪ Tsuga mertensiana (Bongard)
Carriere
(mountain hemlock)
⑫ Abies lasiocarpa (Hooker)
Nuttall
(alpine fir)
⑩ Abies grandis (Douglas
ex D. Don) Lindley
(grand fir)
⑨ Abies amabilis (D. Douglas
ex Loudon) Forbes
(Pacific silver fir)



Ⓓ *Abies amabilis* (D.Douglas ex Loudon) Forbes
(Pacific silver fir)

1-Cones erect, dark-purple, cylindrical, 8 to 10 cm long. Scales fan-shaped.
2-Needles dark shiny green on the upper surface with two silvery stripes underneath, about 2.5 cm long (if silvery on upper surface, then only near the tip); needles spreading, with upper layer pressed toward the tip of the twig forming a v-shape.
3-Bark thin, smooth, unbroken, except on old trees pale or ash-grey with conspicuous chalky white patches.
4-From low elevations to timberline in Coast Range and Vancouver Island.

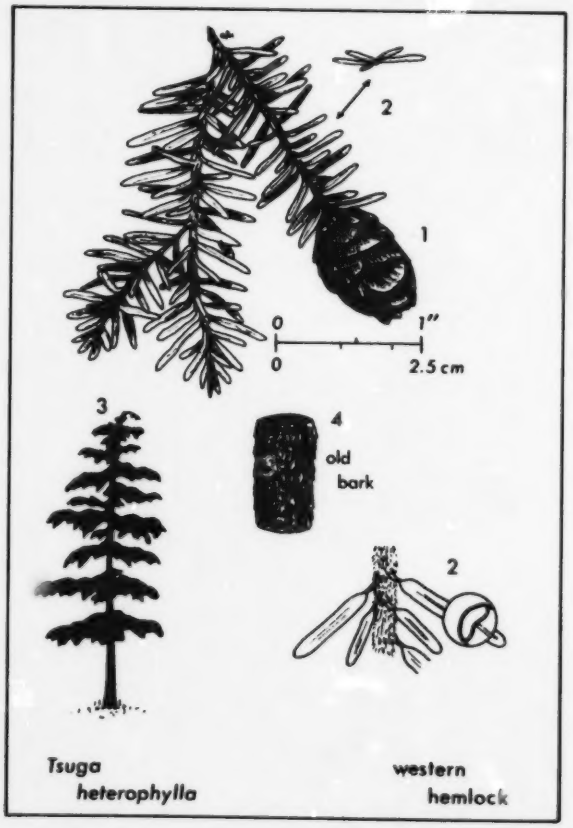


Ⓒ *Abies grandis* (Douglas ex D. Don) Lindley
(grand fir)

1-Cone cylindrical, 6 to 11 cm long, yellow-green, scales broader than long.
2-Needles distinctly 2-ranked (oriented in flat plane), green above, whitish below, 3.8 cm long.
3-Bark, when young, thin, grey-brown with resin blisters and chalky white patches. Old bark 5 to 7.6 cm thick, usually furrowed into hard reddish brown ridges.
4-Southern coast, Vancouver Island, and lower valleys in the Columbia Forest.

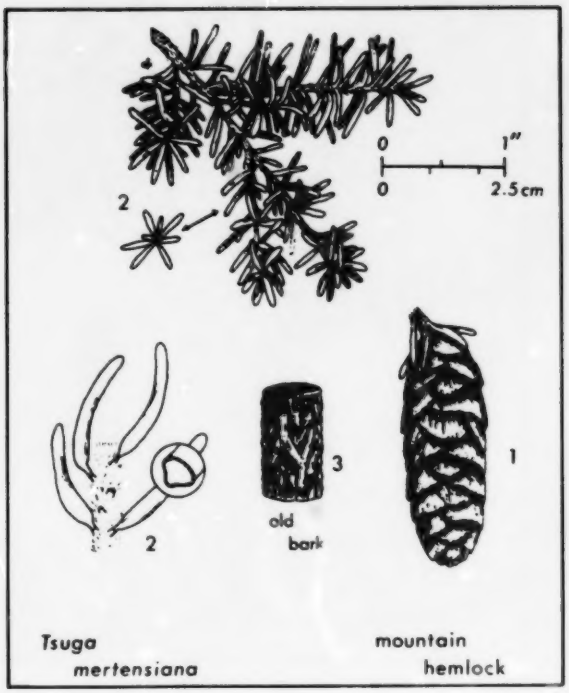
Ⓔ *Abies lasiocarpa* (Hooker) Nuttall
(alpine fir)

1-Cone dark-purple, 5 to 10 cm long, somewhat wider near the base, scales fan shaped.
2-Needles about 3.8 cm long, deep blue-green, with silvery stripes on upper and lower surfaces, needles usually curved upward and crowded.
3-Trees symmetrical, narrow and spire-like.
4-Bark smooth, grey with resin blisters, old trees with shallow longitudinal furrows.
5-Throughout the province, in subalpine, boreal and sub-boreal forests.



Ⓐ *Tsuga heterophylla* (Rafinesque) Sargent
(western hemlock)

1-Cone egg-shaped, less than 2.5 cm long, scales thin with more or less wavy edges.
2-Leaves flattened, round-tipped, appearing two-ranked, rather variable in length, up to 3.2 cm. Each leaf with a twist at the abruptly narrowed base, lighter lines on under surface.
3-Trees large (35-50 m high) with narrow pyramidal crown having drooping leader.
4-Trees when young, with rusty-brown bark covered with fine scales. Older trees with darker bark having flat, scaly ridges with deep furrows.
5-Coastal forests and interior wet belt.



⑧ *Tsuga mertensiana* (Bongard) Carriere (mountain hemlock)

1-Cone cylindrical, more than 2.5 cm long, purple to brownish purple, scales slightly thickened.

2-Leaves semi-circular in cross section, projecting out all around the twig.

3-Bark dark reddish-brown, roughened and with hard, narrow, rounded ridges.

4-Tree small (7.5 - 15 m high).

5-Subalpine forests in coastal and interior wet belt areas.

CHART 6

1. Needles pointed at tip

spruces, yews and Douglas-firs

1. Twigs rough, due to peg-like leaf bases
2. Leaves more or less four-sided, stiff and prickly

spruces

1. Twigs covered with dense, dark-reddish hairs
2. Cones 1.3 to 3.8 cm long, egg-shaped

Ⓐ *Picea mariana* (Miller) B.S.P. (black spruce)

1. Twigs smooth or young twigs covered with dense very fine hairs (older branches smooth)
2. Cones 2.5 to 10 cm long, cylindrical

1. Needles flattened in cross section, spreading out all around the twig
2. Cones pale yellow to reddish-brown, 5-10 cm long; scales thin, stiff and wavey-edged

Ⓑ *Picea sitchensis* (Bongard) Carriere (Sitka spruce)

1. Needles four-sided in cross section, crowded and curved upward
2. Cones pale green or brown, approx. 5 cm long; scales thin and flexible

1. Cone scales broad with a smooth edge
2. Twigs smooth or only sparsely hairy

Ⓒ *Picea glauca* (Moench) Voss (white spruce)

1. Cone scales narrow with a distinctly ragged edge
2. Young twigs covered with dense, very fine hairs

Ⓓ *Picea engelmannii* Parry ex Engelmann (Engelmann spruce)

1. Twigs smooth (not having peg-like leaf bases)
2. Leaves more or less flattened, not four-sided

yews

1. Shrubs or low trees usually less than 6.2 m tall
2. Fruit a fleshy berry
3. Leaves two-ranked

Ⓔ *Taxus brevifolia* Nuttall (western yew)

Douglas-firs

1. Tall trees, often over 30 m tall
2. Fruit a woody cone
3. Leaves not two-ranked, twigs with oval leaf scars

1. Bracts on cones straight and pressed flat against the cone scales
2. Foliage yellowish-green

Ⓕ *Pseudotsuga menziesii* (Mirbel) Franco var. *menziesii* (coast Douglas-fir)

1. Bracts on cones curved, flat to spreading or reflexed
2. Foliage bluish-green

Ⓖ *Pseudotsuga menziesii* (Mirbel) Franco var. *glauca* (Beissner) Franco (Interior Douglas-fir)

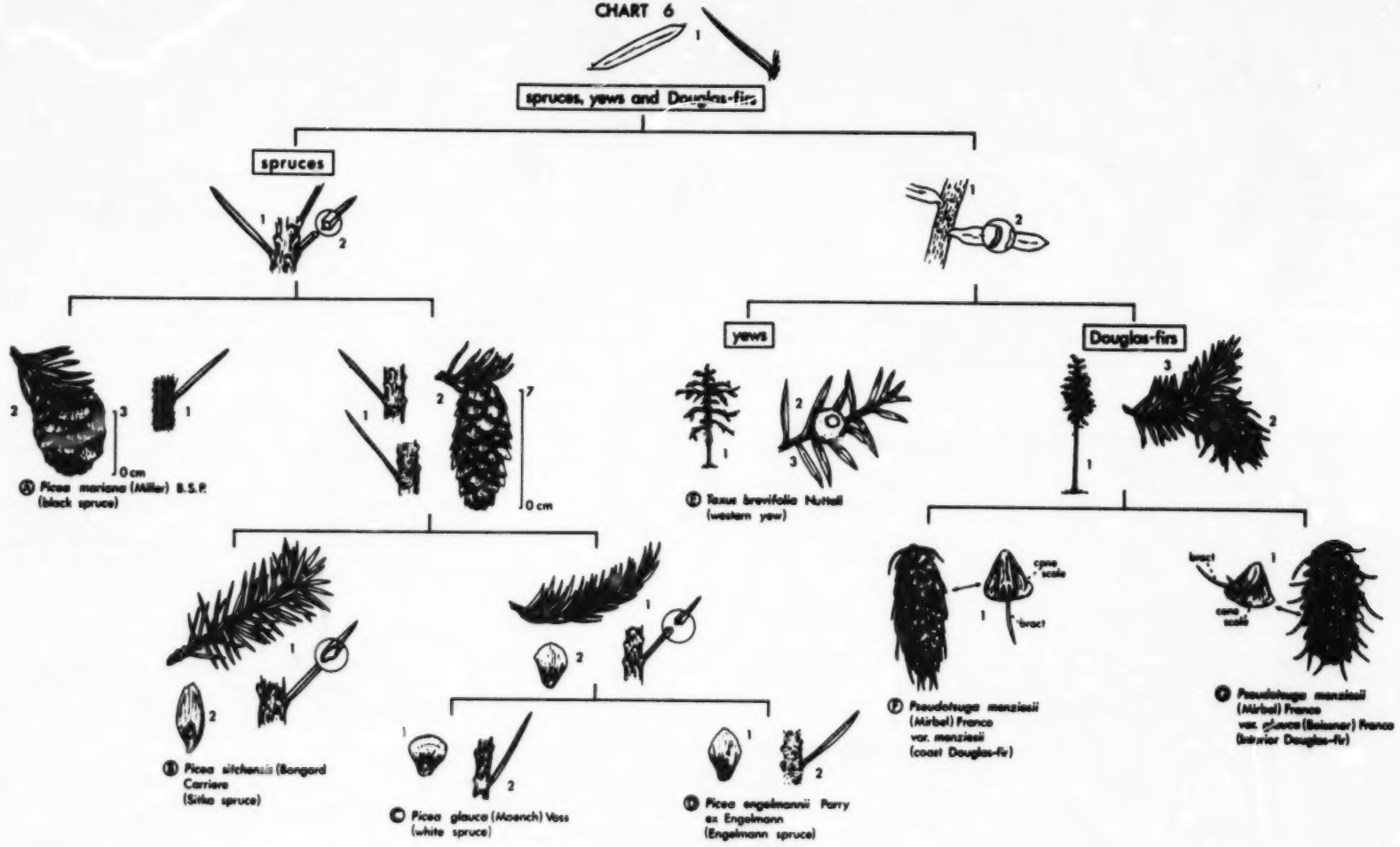
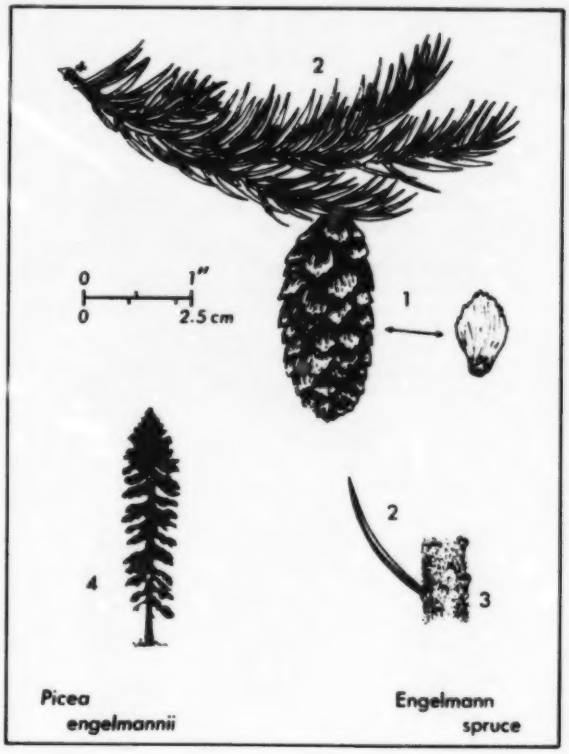
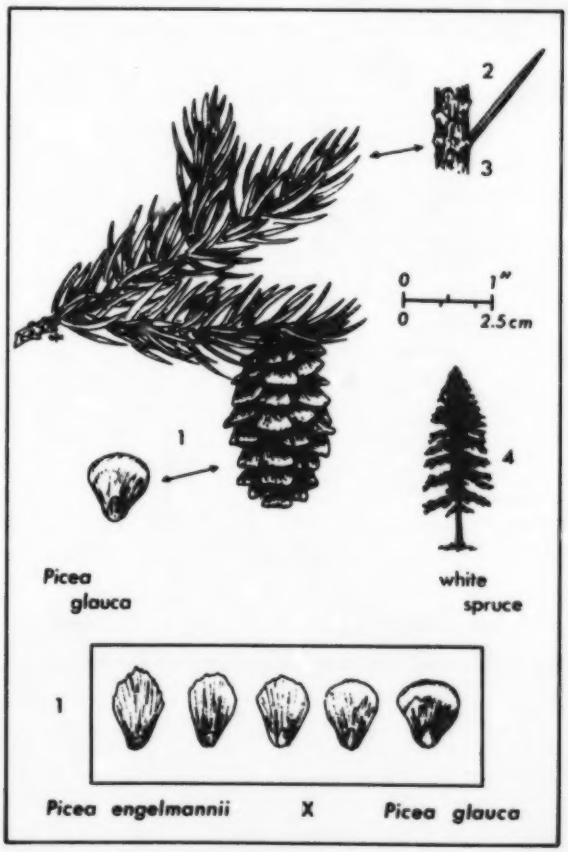


CHART 6
spruces, yews and Douglas-firs
spruces
yews
Douglas-firs
Ⓐ Picea mariana (Miller) B.S.P. (black spruce)
Ⓑ Picea sitchensis (Bongard Carriere (Sitka spruce)
Ⓒ Picea glauca (Moench) Voss (white spruce)
Ⓓ Picea engelmannii Parry ex Engelmann (Engelmann spruce)
Ⓔ Taxus brevifolia Nuttall (western yew)
Ⓕ Pseudotsuga menziesii (Mirbel) Franco var. menziesii (coast Douglas-fir)
Ⓖ Pseudotsuga menziesii (Mirbel) Franco var. glauca (Beissner) Franco (interior Douglas-fir)
0 cm
7
cone scale
bract



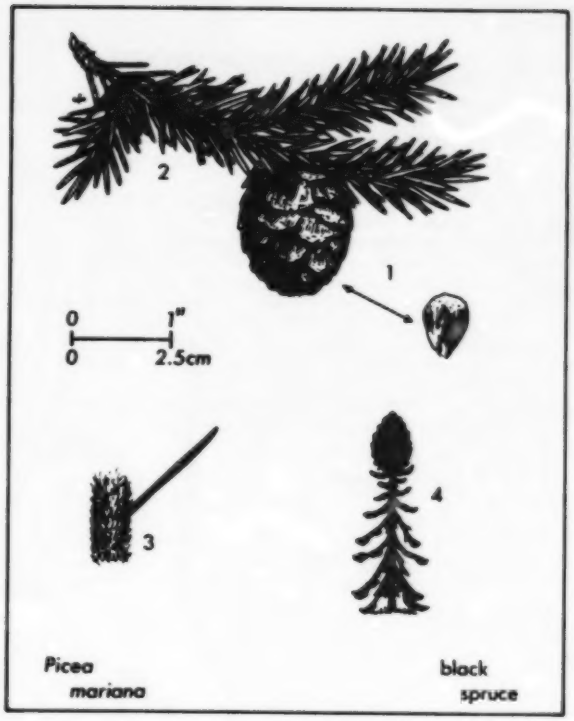
Ⓓ *Picea engelmannii* Parry ex Engelmann
(Engelmann spruce)

1-Cones about 5 cm long, edges of scales distinctly ragged, cones attached at tips of branches, never forming a dense cluster.
2-Needles 1.3 to 2.5 cm long, usually curved upward.
3-Twigs, when young, have dense, very fine hairs.
4-Mature trees usually narrow often interrupted. Branches often distorted, rarely ever forming distinct layers of foliage or regular whorls around the stem. Mature foliage dark green.
5-Bark thin, brownish to cinnamon-red, outer layers broken into small, thin, loosely attached scales.
6-Subalpine forests of central and southern B.C., not found west of the Coast Mountains.



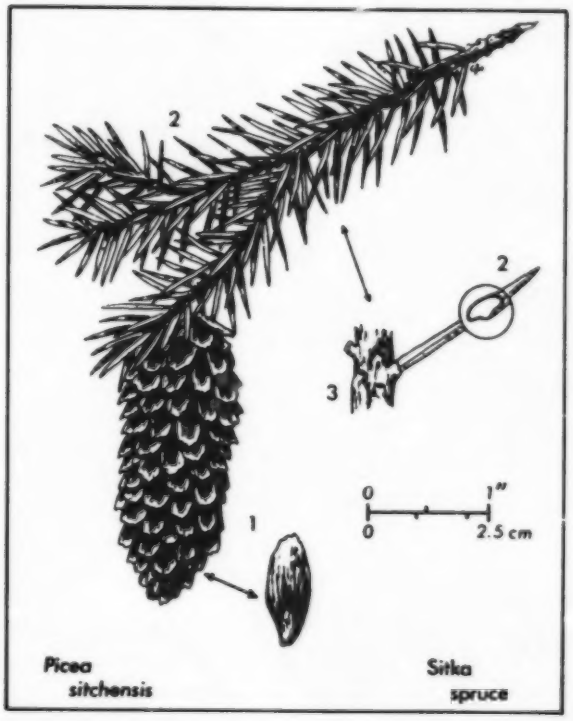
Ⓒ *Picea glauca* (Moench) Voss
(white spruce)

1-Cone about 5 cm long, scales rounded and blunt, with smooth edges (hybrids, between Ⓒ and Ⓓ abundant in contact zones, many show intermediate features).
2-Needles 1.3 to 1.9 cm long, blue-green, sharp-pointed, and usually straight.
3-Twigs, when young, smooth or only sparsely hairy.
4-Tree conical.
5-Bark ashy brown, with long and rough scales.
6-Boreal and Montane forests, east of Cascades.



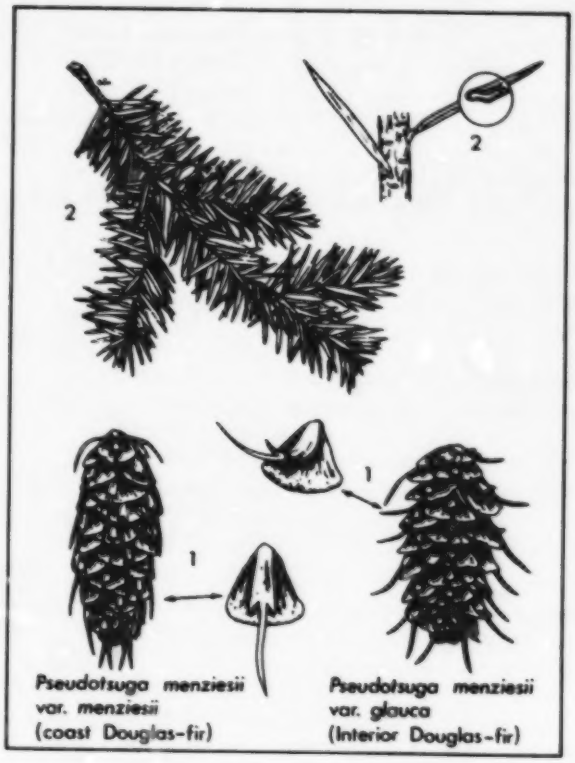
Ⓐ *Picea mariana* (Miller) B.S.P.
(black spruce)

1-Cones egg-shaped, purplish-green, 1.3 to 3.8 cm long, often forming dense clusters, scales stiff, rounded, with irregularly toothed margins, staying compressed (not open).
2-Needles 1.3 to 1.9 cm long, sharp pointed, and dark bluish-green.
3-Twigs, when young, with dark-reddish hairs.
4-Often a low stunted tree; crown usually with a somewhat club-like shape.
5-Bark (inner living part) olive green. Outer surface scaly, greyish to reddish.
6-In northern and central B.C. east of Cascades. In bogs, wet sites and coarse-textured soils of rapidly drained sites.



Ⓑ *Picea sitchensis* (Bongard) Carriere
(Sitka spruce)

1-Cone cylindrical, pale-yellow to reddish-brown, 5 to 10 cm long, scales thin, stiff with wavy edges.
2-Needles somewhat flattened, stiff and sharp-pointed; yellowish-green above, whitish below.
3-Twigs without hairs.
4-Bark dark-brown, scaly, scales thin, loose, crisp.
5-Restricted to coastal forests.

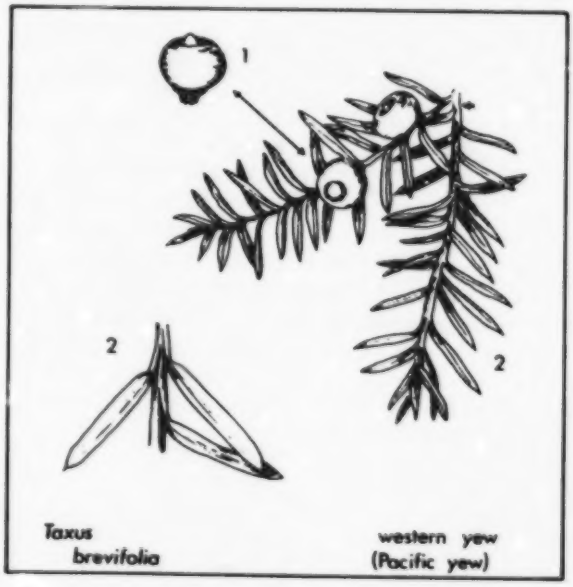


Ⓕ *Pseudotsuga menziesii* (Mirbel)
Franco var. *glauca* (Beissner)
Franco
(Interior Douglas-fir)

1-Cones mostly 4-7 cm long; oval, pendant bracts three-toothed, longer than scales; bracts flat to spreading or reflexed (thus appearing longer than those of coast variety).
2-Needles more or less flattened, leaving oval scars or smooth twigs, foliage bluish-green and grooved above, paler below.
3-Trees of somewhat open foliage, seldom over 45 m tall.
4-Bark, when young, smooth, grey-brown with resin blisters, older bark thick (up to 25 to 30 cm) corky and cracked, deeply fissured into reddish-brown ridges.
5-Throughout the central and southern interior (east of Coast Mountains) at low to medium elevations.

Ⓖ *Pseudotsuga menziesii* (Mirbel)
Franco var. *menziesii*
(Coast Douglas-fir)

1-Cones 6 to 10 cm long; oval, pendant bracts three-toothed, longer than scales; bracts straight and pressed flat against the scales.
2-Needles more or less flattened, leaving oval scars on smooth twigs; foliage yellowish-green and grooved above, paler below.
3-Trees of somewhat open foliage, 45-65 m tall (may be even 90 m tall).
4-Bark, when young, smooth, grey-brown with resin blisters, older bark thick (up to 25 to 30 cm) corky and cracked, deeply fissured into reddish-brown ridges.
5-Coastal B.C., generally south of Prince Rupert.



Ⓔ *Taxus brevifolia* Nuttall
(western yew)

1-Fruit about .8 cm long, single berries, green turning reddish at maturity, with an opening at its tip through which the "stone" is exposed.
2-Needles 1.3 to 2.5 cm long, flattened, appearing two-ranked, oriented in a flat plane.
3-Bark very thin, dark reddish-purple with papery scales.
4-Sea level to mid elevations on coast and Vancouver Island, and in Columbia forests and nearby Montane forests

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